

3. DATA INVENTORY AND ANALYSIS



3.1 POPULATION ANALYSIS

3.1.1 Introduction

The analysis of population trends serves as a fundamental basis for many planning decisions. The size of the population, its composition, and its spatial distribution impact future social, economic and physical land use needs. An examination of the current population *size* and trends over recent years provides an estimate of current land use and spatial needs. The use of future population projections relates to the anticipated future land use and space needs. Population *composition* provides the breakdown by categories, such as age and race. This information assists in determining the division of space needs for schools, youth and senior recreation areas, social services and other community facilities for various population characteristic categories. Population *distribution* indicates where in a community the population is growing and where it is declining. These trends assist in determining where the small area plans are needed and where various land uses, transportation routes and community facilities should be located throughout the county or urban area to meet future needs and demands.¹

It is important to note that, because of the timing of this *Update* in relation to the release of the 2000 Census data, most of the planning decisions, including all existing and future land use analyses and projections, were based upon available 1990 Census data and University of Louisville State Data Center 1999 population estimates. Available 2000 Census data was added to this Chapter (Data Inventory and Analysis) after the Land Use Element and maps were adopted. This first release of 2000 Census data was one of the considerations during the analysis for and development of the Community Facilities Element.

The following exhibits and comments discuss relevant data and trends for Lexington and Fayette County for analysis and use in this *2001 Plan Update*. Much of the 1990 Census data for Fayette County was available by census tract and, if relevant, that is how it is analyzed. Detailed 2000 Census data was not yet available; summary population data has been added to the exhibits in this chapter as relevant. Additionally, the Lexington Urban Area has been divided into Planning Sectors, which have been utilized over the last three Comprehensive Plans. The Planning Sectors have been aggregated into four planning areas for much of the land use data analysis found in Sections 3.4 and 6.3 of this *Plan Update*.

¹F. Stuart Chapin and Edward J. Kaiser, *Urban Land Use Planning*, Urbana: Univ. of Illinois Press, 1979, p. 162.

3.1.2 Past Population Characteristics

Size

The growth pattern of Fayette County and the seven-county central Bluegrass metro area between 1970 and 2000 is shown in Exhibit 3-1. The population of the entire seven-county area has grown steadily over this time frame. Fayette County, as a percentage of the metro area population, has declined slightly from 56.3 percent in 1970 to 54.4 percent in the 2000 Census. Fayette County, as a percentage of the regional population, is anticipated to continue to decline slightly as Fayette County's

Urban Service Area Boundary and Rural Land Management program guide future population growth and location. This is reflected in the fact that while Fayette County has grown by 49 percent over the three decades since 1970, the seven-county region has grown by 55 percent. Local land use policies in each of the six counties surrounding Fayette County (Bourbon, Clark, Madison, Jessamine, Woodford, and Scott) will impact how much growth each of these counties experience in the future as well. Both Fayette County and the entire metro area have grown more rapidly than the state as a whole over this time period (25.5%).

EXHIBIT 3-1 POPULATION GROWTH IN FAYETTE COUNTY AND THE FAYETTE METRO AREA				
	1970	1980	1990	2000
Fayette County	174,323	204,165	225,336	260,512
7 county metro area total	309,431	370,981	405,936	479,198
Fayette County as % of metro	56.3%	55.0%	55.5%	54.4%
State	3,218,697	3,660,777	3,685,296	4,041,769
Source: US Census Bureau, <i>Census of Population</i> , 1970-2000.				

Population Composition

The changes in the age composition of Fayette County's population over the last three decades are depicted in Exhibit 3-2. Paralleling trends throughout the United States, Fayette Countians have had fewer children over the last three decades; therefore, the percentage of the population in the under 17 age bracket has decreased in this time period from 32 percent of the population in 1970 to 21 percent of the population in 2000. The percentage of persons 18 to 64 years of age increased from 60 percent of the total population in 1970 to 70 percent of the 2000 population. This

reflects the aging of persons born during the post-war baby boom. Additionally, the percentage of persons over 65 years old has increased slightly from 8 percent of the population in 1970 to 9 percent of the 2000 population. This reflects increased longevity and the choice of Lexington for retirement by many people.

For planning purposes, it is important to utilize both actual numbers of people, as well as percentage breakdowns of the population, to ensure that local community facilities and infrastructure can meet the community's changing needs. A look at the changes

EXHIBIT 3-2 POPULATION AND PERCENT BY AGE CATEGORY LEXINGTON/FAYETTE COUNTY, 1970 - 2000								
	1970		1980		1990		2000	
Age	Total Pop.	% Pop.	Total Pop.	% Pop.	Total Pop.	% Pop.	Total Pop.	% Pop.
0-17	55,805	32 %	51,667	25 %	50,460	22 %	55,533	21 %
18-64	104,954	60 %	134,952	66 %	152,603	68 %	181,146	70 %
65+	13,564	8 %	17,546	9 %	22,303	10 %	23,833	9 %
Total	174,323	100 %	204,165	100 %	225,366	100 %	260,512	100 %
Source: US Census Bureau, <i>Census of Population</i> , 1970-2000.								

in preschool and school age children can assist decision makers regarding school and recreation needs. The significant growth and retention of the major age categories contributing to the local workforce is vital to local economic stability. The increases in the older population will create demands for different health and service industries.

Exhibit 3-3 depicts the total Fayette County population figures and percentages by race – White, Black, Asian, and other – and by Hispanic origin. As noted in a footnote, the population counts for Hispanic origin overlap with population counts for White and Black; therefore, the numbers in the table do not total the total population for the County.

EXHIBIT 3-3 POPULATION AND PERCENTS BY RACE LEXINGTON/FAYETTE COUNTY, 1970 - 2000											
	White		Black		Asian		Other***		Hispanic*		Total Pop.
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%	
1970	152,216	87.3	21,467	12.3	241	0.1	399	0.2	867**	0.5	174,323
1980	174,605	85.5	27,121	13.3	1,360	0.7	1,079	0.5	1,488	0.7	204,165
1990	190,448	84.5	30,143	13.4	3,713	1.6	1,062	0.5	2,556	1.1	225,366
2000	211,120	81.0	35,116	13.5	6,407	2.5	7,869	3.0	8,564	3.3	260,512
*Note: Hispanic population counts overlap with white and black race counts and total population, therefore, does not include this figure. **Note: Count is for 1970 Census category "Persons of Spanish Language". ***Note: 2000 Census data figures for "Other" reflect the following race categories: American Indian and Alaska Native (507 persons); Native Hawaiian and other Pacific Islander (83 persons); "some other race" (3,165 person), and persons with "Two or more races" (4,114 persons). Source: US Census Bureau, <u>Census of Population</u> , 1970-2000.											

Population Distribution

Typically, urban areas begin to grow as they begin to be able to provide a wider variety of services, such as water; sewer; schools; police and fire protection. They then also have the population base to begin to support economic activities, such as places of employment and variety and competition in goods and prices. Once these services are in place, urban areas are equipped to handle growth more readily; and population concentrations, therefore, tend to locate within or immediately adjacent to these urban areas. Exhibit 3-4 depicts the distribution of Fayette County's population between the urban and rural portions of the County and reflects land use policies that have encouraged growth to occur in the urbanized area over the years.

Data presented in Exhibit 3-4 further breaks down the demographic data for Lexington and its urban area in relation to New Circle Road

(completed in 1968). Prior to 1974, Lexington was an incorporated city; but even as early as 1950, the area classified as urbanized by the Census included an urban fringe outside the city limits. In 1950, the population of Lexington itself was 55,534; however, the urbanized area included over 75,000 people. Construction of New Circle Road began in 1948 and was not completed for twenty years.

EXHIBIT 3-4 URBAN/RURAL POPULATION DISTRIBUTION FAYETTE COUNTY 1950-2000							
	Urban Pop.	% of	Urban Pop.	% of	Rural	% of	Total
	Inside NC	Total	Outside NC	Total	Pop.	Total	County Pop.
1950	75,311*	74.8	NA	NA	25,435	25.3	100,741
1960	110,324	83.6	1,616	1.2	19,966	15.1	131,906
1970	123,623	70.9	35,915	20.6	14,785	8.5	174,323
1980	118,011	57.8	76,082	37.3	10,072	4.9	204,165
1990	113,231	50.2	105,937	47.0	6,198	2.8	225,366
2000	111,828	43.0	136,592	52.4	12,092	4.6	260,512
*Note: Total urban population as reported by 1950 Census; New Circle Road not complete. Total urban population for 1950, 1960, 1970 is greater than the population of city of Lexington, based on census definition of urbanized area. Source: US Census Bureau, <u>Census of Population</u> , 1950-2000.							

The 1950 data, therefore, does not quantify the urbanized data in relation to New Circle Road. The Urban Service Area concept was adopted in 1958. Beginning in the 1960s, a significant portion of the city's urban growth began to occur outside New Circle Road but within the Urban Service Area (USA). In 1974, the city of Lexington and Fayette County merged to form a unified Urban County Government. From a high in 1970, the number of people residing within New Circle Road declined over the last three decades, while the number and percent of the Fayette County population residing outside New Circle Road, but within the USA, grew significantly (Map 3.1).

After decades of a declining rural population, in the 1990s the rural population nearly doubled to over 12,000 people. Residential growth pressures in the rural area in the 1990s were part of what led to the decision to develop a separate planning document entitled the *Rural Service Area Land Management Plan (RLMP)*. This *RLMP* was adopted in 1999 and is discussed in more detail in Section 6.7 of this *Plan Update*. Subsequent to the adoption of the *RLMP*, the Planning Commission and the Urban County Council adopted new provisions for the rural portions of the County (approximately 70 percent of the County's land area). The new requirements of a 40-acre minimum in the Agricultural Rural zone and new related zones in the Rural Service Area (RSA), in combination with adoption of the Purchase of Development Rights (PDR) provisions, are intended to strengthen the USA concept and continue to closely tie urban development with the USA and its urban services.

3.1.3 Components of Population Change

The census data presented thus far shows the population of Fayette County growing steadily over the decades, with a total growth of 156 percent between 1950 and 2000. Population growth in the 1950s and 1960s was over 30 percent each decade, slowing to 17 percent in the 1970s and 10 percent in the 1980s. Growth in the 1990s rose again to nearly 16 percent.

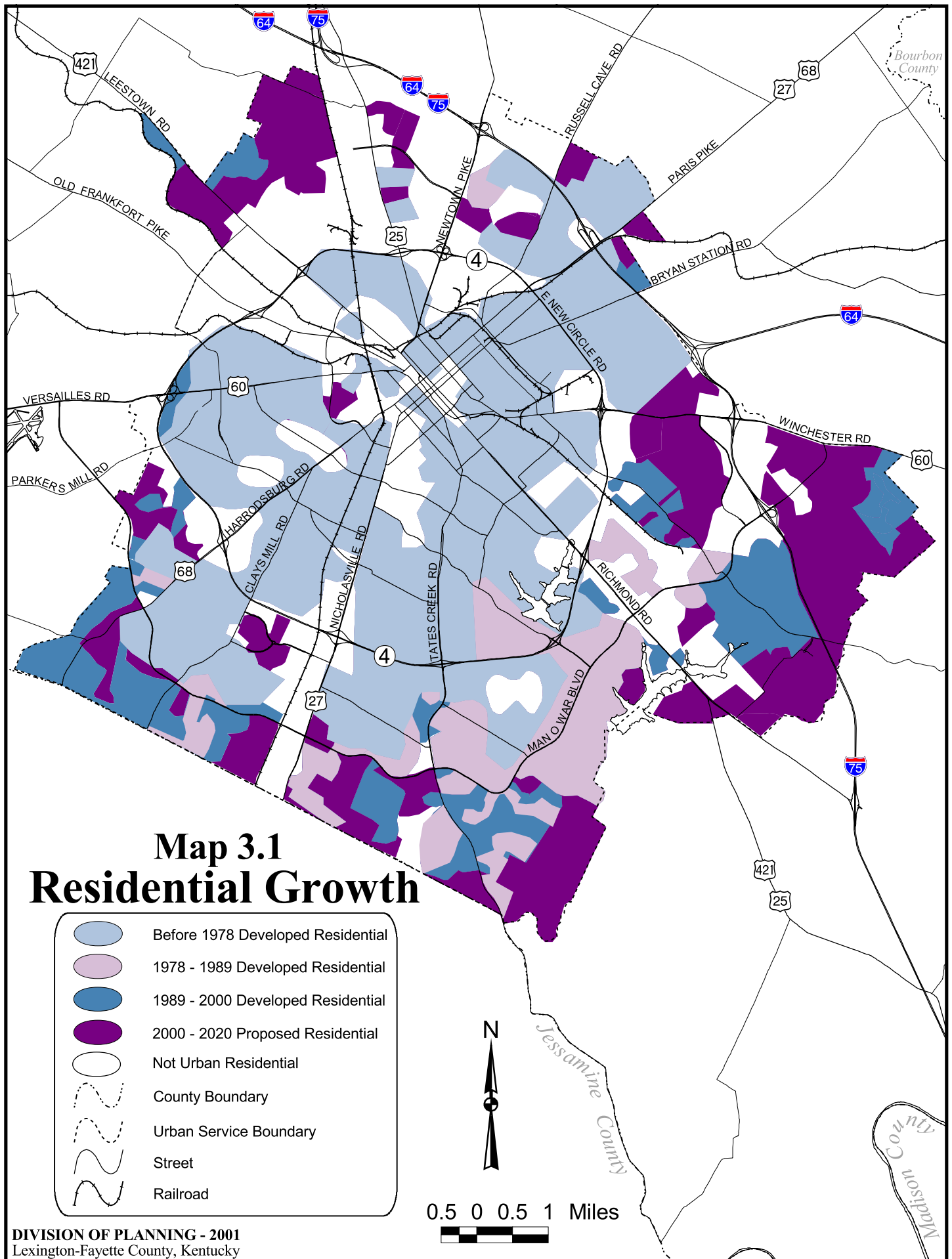
An examination of the components of the changes in a county's population can be useful in

understanding the growth trends and helpful in anticipating future growth patterns. These components are natural increase and net migration. Natural increase is determined by the number of births minus the number of deaths. Net migration is the total number of persons who migrated into the county minus the total number of persons who migrated out. Because the birth rates have been declining and the number of deaths increases with an aging society, it can be important to examine each of these factors within a county to determine what is affecting the population changes. This expands our understanding and results in more accurate population projections. The components of Fayette County's population change from 1960 to 1999 are shown in Exhibit 3-5.

EXHIBIT 3-5 COMPONENTS OF POPULATION CHANGE FAYETTE COUNTY 1960 - 1999			
	Births	Deaths	Net Migration
1960-1969	33,291	13,099	+ 22,225
1970-1979	31,485	14,554	+ 12,911
1980-1989	32,063	15,636	+ 4,774
1990-1999	31,466	17,019	+ 3,972
Sources: Kentucky Vital Statistics (1960-1997) Kentucky State Data Center estimates for 1990's.			

Data in Exhibit 3-5 indicates that the Kentucky State Data Center underestimated the net migration data for Fayette County in the 1990s. The 2000 Census totals available for Fayette County imply that the County grew by nearly 17,000 people more than the State Data Center projection data indicated. As birth and death records are fairly factual, the difference must be attributed to unanticipated in-migration. Migration may be the most important indicator of the population growth of an area because it is so intimately tied with the economic health of the area. Migration is often directly related to the employment opportunities of a city, county, or the surrounding counties. New employment opportunities in a county or in its neighboring counties will be reflected in a corresponding in-migration to the area.

Corroborating the migration trends as more detailed 2000 Census data becomes available will be critical



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Lexington-Fayette County, Kentucky

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in projecting population trends into the future for the next Comprehensive Plan Update. At the current time, the data in Exhibit 3-5 reflects the Kentucky State Data Center's determination that all of the in-migration in the 1990s into Fayette County occurred between 1990 and 1994, and that Fayette County experienced out-migration after 1995. With the 2000 Census total for Fayette County nearly 7 percent higher than projected by the State Data Center, assumptions related to migration can be assumed to be incorrect. Fayette County needs to continue to provide opportunities for increasing the net migration figures by taking advantage of economic opportunities that are available to the County. Ideas, such as developing more opportunities for recent University of Kentucky graduates to stay in Fayette County, could have a significant positive impact on Fayette County's population and economy. Additionally, looking for ways to meet the needs of Fayette County's growing Hispanic population can be another opportunity to see County growth and establish a growing local work force.

3.1.4 Future Population Forecasts

As noted above, population analysis is important to the planning process. Knowledge of past and present population characteristics is essential to meaningful projections of future population levels and characteristics. Future population levels are important since they determine both the amount of land to be developed in the future and, to a large extent, the type of development (residential or commercial, for example) that will soon occur. An understanding of the present population characteristics also helps the community (city or county) to determine the adequacy of existing land use, land use patterns, economic arrangements, and community facilities in terms of meeting existing needs.

Because local units of government have land use policies that can impact local rates and locations of growth, it is sometimes difficult to utilize standard projections done by standard models. Exhibits 3-6 (table) and 3-7 (graph) depict a variety of population

projections that have been prepared for Fayette County over the last few years. The decision regarding which projections are determined to be most accurate impacts the future land use discussion in a comprehensive plan.



Two of the projections come from the University of Louisville's State Data Center (SDC) Population Research Unit. In 1995 the SDC utilized two series of projections: *high growth* series and *moderate growth* series that made differing assumptions about in-migration to the county. The *high growth series* projection is depicted on the Exhibits. In 1999, the SDC only developed a single set of projections for each county. This projection was closely tied to their assessment of the county's migration trends in the 1990's, now determined to be inaccurate. Other projections depicted in Exhibits 3-6 and 3-7 are from the *1996 Comprehensive Plan*, the *2025 Transportation Plan*, and a set of projections the Long-Range Planning Section developed in 1992 utilizing the cohort-survival technique. Finally, very preliminary projections have now been made by the Long Range Planning Section based upon preliminary 2000 Census data. These projections are depicted in Exhibits 3-6 and 3-7 but were utilized only in the consideration of Community Facilities needs and discussions.

EXHIBIT 3-6 POPULATION PROJECTIONS FAYETTE COUNTY 1990 - 2020

	1990	1995	2000	2005	2010	2015	2020
1995 SDC High	225,366	241,728	260,681	275,991	290,000	303,920	317,032
1996 Plan	225,366	240,261	254,490	263,757	272,709	277,442	
1992 Long Range Planning	225,366		245,443		266,234		272,954
2025 Transportation		226,946	237,552	246,690	259,330	269,160	282,557
1999 SDC	225,366		242,564	246,065	248,612	250,039	250,282
2001 Interim Projections			260,512		280,000		300,000

Sources: University of Louisville, Urban Studies Center, Population Research Unit, How Many Kentuckians; Population Forecasts, 1990-2020, 1995 Edition and 1999 Edition;

Lexington-Fayette County 1996 Comprehensive Plan;

Lexington-Fayette County Metropolitan Planning Organization's 2025 Transportation Plan

EXHIBIT 3-7 ALTERNATE POPULATION PROJECTIONS - FAYETTE COUNTY 1990 - 2020

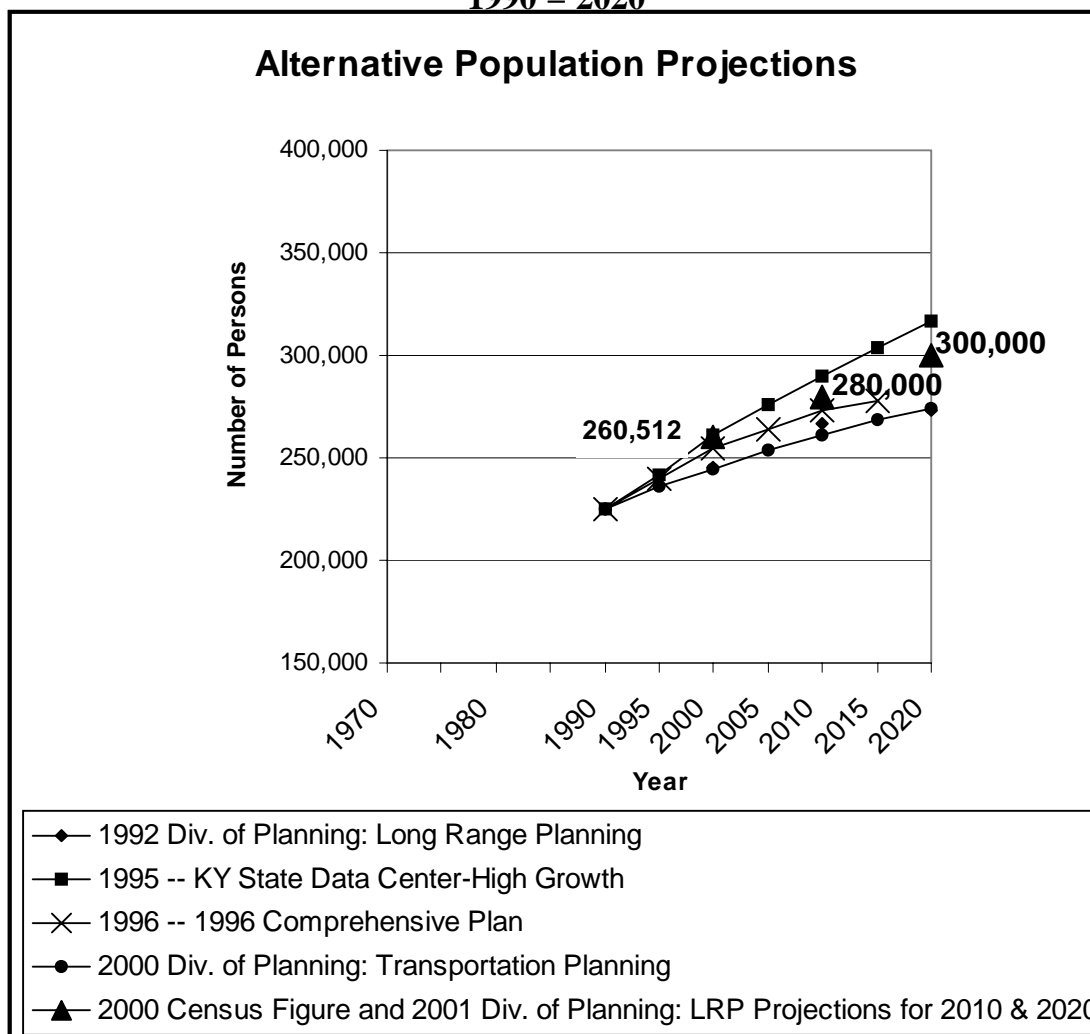




EXHIBIT 3-8
RESIDENTIAL BUILDING PERMIT DATA
FAYETTE COUNTY 1960-1999

	Single Family	% of	Multi-family	% of	10 year Average Annual		Total Permits
	Permits Issued	Permits	Permits Issued	Permits	Single Family	Multi-Family	Issued
1960-1969	11,718	51.7%	10,940	48.3%	1,172	1,094	22,658
1970-1979	11,257	46.0%	13,204	54.0%	1,126	1,320	24,461
1980-1989	11,248	55.2%	9,123	44.8%	1,125	912	20,371
1990-1999	16,325	79.0%	4,335	21.0%	1,633	434	20,660

Note: Single Family includes single family and townhouse; multi-family covers 2-, 3-, 4-plex, plus apartments. 1998 and 1999 multi-family figures include retirement/nursing home units.

3.2 HOUSING ANALYSIS

Exhibit 3-8 depicts historical residential building permit data for Fayette County by decade from 1960 to the present. Growth of single family homes was very consistent throughout the decades of the 1960s, 1970s, and 1980s, with each year averaging just over 1,100 single family permits; while in the 1990s single family permits averaged over 1,600 per year. In the 1990s, single family permits comprised 79 percent of the total permits issued. Multi-family growth varied much more over the decades, with a peak in the 1970s of over 1,300 per year and a low of just over 400 permits a year in the 1990s (21 percent of the total permits). This data depicts permits only and does not necessarily

reflect actual construction. It also does not take into account demolitions that may have occurred in the same time period.

Map 3.2 and Exhibit 3-9 depict total new residential units permitted between 1995 through 1999, geo-coded by Census tract (on the map) and by planning sector. Exhibit 3-9 breaks the data down by housing type and notes demolition permits by sector. Significant growth has occurred in Census tracts 39.03 (Sectors 8 and 9A), 41.02 (Sector 10), and 42.02 (Sector 11D) during this time period. Approximately 11 percent of the permits issued during this five-year period were issued for construction inside New Circle Road.

EXHIBIT 3-9 BUILDING PERMIT DATA BY PLANNING SECTOR-NEW RESIDENTIAL UNITS FAYETTE COUNTY JANUARY 1995-DECEMBER 1999						
Planning Sector Number	Single Family Units	Duplex Units	Townhouse Units	Apartment Units	Total New Units	Units Demolished
1	32	2		24		
2					204	338*
3				62	173	41
4		4		99	302	13
5	81	54	30	387	552	74
6	648		9		657	1
7				2	87	
8	1400		164		1753	5
9A	1428	4	492		2944	
9B					44	1
10	1442	130	230	884	2686	
11	787	2		100		4
11D	659			508	1193	
12						
outside USA						
not geocoded	209		80	158		

*Note: Includes Charlotte Ct. demolition of 253 units, permit issued Sept. 1999.

Notes: Data does not reflect whether or not the construction/demolition has been finalized and come from records re-keyed from photocopied packets (secondary source) and should be used as an estimate only.

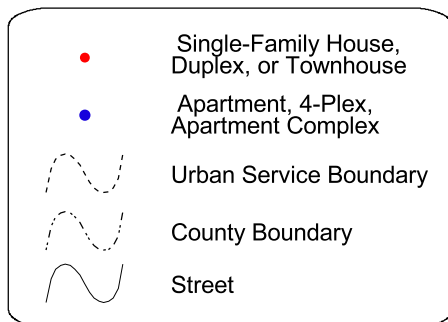
While believed infrequent, some error in placement on map may have occurred during geocoding process (min. scores = 55; offset dist. = 15 ft.) Since May 1997, voids and reissues are no longer tracked by building inspection and, thus, reissues of expired permits could produce a few "double counts."

Number of residential units demolished were taken at face value from building inspection data, with 0 units understood to be no residential units removed (e.g. garage, house converted to business).

The records most commonly used for data compilation were 411 Single Family Residence, 412 Townhouse, 414 Duplex, 429 Apartment, and 912 Wreck Structure Residential. Permits under 010 Government Building Local and 911 Wrecking Public have also been included when understood to apply to residential living units (e.g. construction on Curley, Wilson, and Eastern Streets in April, 1996; or demolition of the Charlotte Court Housing Project in Sept., 1999).



Map 3.2 New Residential Units According to Building Permits, 1995 to 1999



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Lexington-Fayette County, Kentucky

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3.3 ECONOMIC ANALYSIS

3.3.1 Introduction

The examination and analysis of the economic characteristics of a local community are critical components of the base study required in the preparation of a Comprehensive Plan. Local economic activity supports a given population that in turn influences the kind and amount of land brought into development. The general health of the economy influences the pace of land development. This health can be determined by examining two major components: stability and balance. Stability is an indication of the ability of a local economy to withstand fluctuations in the regional and national economies. Balance refers to the level of diversification of the economy. The more diversified the local economic and employment base, the more difficult it is to disrupt the local economy. Diversification enables expansion of the economic base due to the increased skill levels and resources available.²



The following economic analysis, when combined with the studies of population, community facilities, transportation and land use, supports decisions made related to the location and intensity of growth in Fayette County. The economic vitality of the county is contingent upon wise management of the existing resources and planning to meet future needs.

3.3.2 Labor Force and Employment Characteristics

Exhibit 3-10 displays the basic employment characteristics of Fayette County residents from 1975 to 1998. Fayette County's employment rate has fluctuated somewhat over the years with the changes in the state and national economies, but employment in Fayette County has been fairly stable and generally above the state averages. In the years

depicted in Exhibit 3-10, Fayette County's highest unemployment rate was 4.9 percent in 1985. While the civilian labor force and total employment in Fayette County has increased steadily since 1975, agricultural employment has fluctuated somewhat and comprised approximately 1.6 percent of the employment in Fayette County in 1998.

² F. Stuart Chapin, *Urban Land Use Planning*, 1965, pp. 153-154.

EXHIBIT 3-10 LABOR FORCE CHARACTERISTICS RESIDENTS OF FAYETTE COUNTY

Civilian Labor Force	Employment			Unemployment	
	Number	Agricultural	Non-Agricultural	Number	Rate
1975	91,111	87,591	2,663	84,928	3,520
1980	110,062	105,392	2,267	103,125	4,670
1985	114,388	108,784	3,078	105,706	5,604
1990	134,047	129,819	2,991	126,828	4,228
1995	136,857	133,329	3,017	130,312	3,528
1998	141,564	138,694	2,194	136,500	2,870

Source: Kentucky Cabinet for Economic Development, *Kentucky Deskbook for Economic Statistics*.

Exhibit 3-11 lists the top ten counties in Kentucky for job growth between 1992 and 1997. This exhibit is the result of a statewide employment analysis, conducted by the University of Kentucky's Center for Business and Economic Research Center, which looked at employment in each of Kentucky's 120 counties. This analysis examined total employment in all industries for the period 1992-1997. Lexington was ranked 2nd in growth in the total number of jobs during this period.

EXHIBIT 3-11 TOP 10 COUNTIES IN KENTUCKY FOR JOB GROWTH, 1992 AND 1997: NUMBER OF JOBS

	1992	1997	Increase
Jefferson	363,978	413,365	49,387
Fayette	137,529	158,233	20,704
Boone	41,557	58,160	16,603
Kenton	42,458	49,885	7,427
Warren	38,548	45,813	7,265
Scott	12,707	19,527	6,820
Hardin	26,236	31,896	5,660
McCracken	31,286	36,675	5,389
Daviess	35,350	40,598	5,248
Madison	19,694	23,990	4,296

Source: University of Kentucky Center for Business and Economic Research.

EXHIBIT 3-12 1990 FAYETTE COUNTY COMMUTING PATTERNS

Into Fayette County	
Total commuting from surrounding states	687
Total commuting from non-surrounding states	424
Total commuting from other Kentucky counties	39,350
<i>Total commuting into Fayette County</i>	<i>40,461</i>
Total living and working in Fayette County	105,018
Total workers working in Fayette County	145,479
Out of Fayette County	
Total commuting into surrounding states	523
Total commuting into non-surrounding states	416
Total commuting into other Kentucky counties	10,420
<i>Total commuting out of Fayette County</i>	<i>11,359</i>
Total living and working in Fayette County	105,018
Total workers residing in Fayette County	116,377
Net commuting into (+) or out of (-) county	+29,102

Source: 1990 U.S. Census Data: Journey to Work Characteristics.

3.3.3 Commuting Patterns

The commuting patterns into and out of a county for employment purposes can be a significant factor in the county's economy. Exhibit 3-12 depicts commuting patterns for Fayette County residents, as well as Fayette County workers for 1990. The data should be carefully re-examined when the 2000

census data is available. Approximately 28 percent of the workers in Fayette County commute in from another county or state, while 72 percent of Fayette County workers work and reside in the County. Additionally, the data in Exhibit 3-12 indicates that 10 percent of Fayette County residents commute to other Kentucky counties or other states.

3.3.4 Diversification

It is critical to the health of Fayette County's economy to have diversified employment opportunities to bring about stability and balance. If a community relies too heavily on a single sector of the economy, changes can potentially have negative effects on the economy. A stable local economy can withstand fluctuations in regional and national economies. A balanced economy and work force is diversified, enabling expansion and growth of the economic base. Diversity is achieved through a mixture of job types, skill levels, and company sizes. This helps the local economy stabilize itself and minimizes the impact of plant closings, relocations or layoffs. While manufacturing has shown a declining role in Fayette County's economy, it is still a significant part

of the regional economy. Although manufacturing employs only 15 percent of the workforce in the region, it represents a much larger percentage of wages and salaries. Fayette County's economy also continues to show the strength of being the regional trade and service center for central Kentucky. Exhibit 3-13 displays the number of Fayette County's non-agricultural workers employed in the various sectors of the economy since 1986 and the percent change by employment sector. Data in Exhibit 3-13 shows that wholesale and retail trade and service industries have continued to grow over the years to the point where over 50 percent of jobs in Fayette County were in these industry categories in 1996.

EXHIBIT 3-13
NON-AGRICULTURAL EMPLOYMENT BY INDUSTRY CATEGORY
BY PLACE OF WORK (FAYETTE COUNTY) 1986 - 1996

	1986	1990	% Change 1986-90	1996	% Change 1990-96	% of Total Non-Agricultural Employment
All Industries	120,089	135,269	+12.6	153,913	+13.8	100.0%
Mining & Quarrying	742	121	-83.7	91	-24.8	0.1%
Contract Construction	6,814	7,236	+6.2	7,977	+10.2	5.2%
Manufacturing	17,113	19,115	+11.7	18,260	-4.5	11.9%
Transportation, Communication, & Public Utilities	5,966	6,543	+9.7	7,851	+20.0	5.1%
Wholesale & Retail Trade	30,938	34,967	+13.0	39,921	+14.2	25.9%
Finance, Insurance & Real Estate	7,464	8,041	+7.7	7,731	-3.9	5.0%
Services	28,390	35,323	+24.4	45,846	+29.8	29.8%
State & Local Government	19,500	21,312	+9.3	23,692	+11.2	15.4%
Other	3,163	2,611	-17.5	3,163	+21.1	2.1%

Source: Cabinet for Economic Development; *Kentucky Deskbook of Economic Statistics*, 1998, 1992, 1988.



3.3.5 Major Employers

Exhibit 3-14 lists Fayette County's 25 largest employers. These employers include university, hospital, and government offices, as well as manufacturing employers. The *2000 Kentucky Directory of Manufacturers* notes that Lexington has 10 of the top 200 manufacturing employers in

Kentucky. The Directory ranks Lexington as second in the state in the number of manufacturing establishments, employees, and population. Fayette County has 380 reported manufacturing establishments with nearly 23,000 employees in Fayette County as of February 2000.

EXHIBIT 3-14 MAJOR EMPLOYERS IN FAYETTE COUNTY (2/2000)		
Employer	Number of Employees	Type of Employer
University of Kentucky	10,562	Education
Lexmark International	6,000	Manufacturing
Fayette County Public Schools	4,906	Education
University of Kentucky Hospital	3,100	Health Care
Lexington-Fayette Urban Co.Gov't.	2,597	Government
Central Baptist Hospital	2,400	Health Care
St. Joseph Hospital	2,000	Health Care
Kentucky Utilities	1,780	Utilities
Veterans' Medical Center	1,500	Health Care
The Trane Co.	1,500	Manufacturing
Dillard's	1,350	Retail
Lexington Clinic	1,170	Health Care
GTE South	1,100	Telecommunications
U.S. Postal Service	1,033	Mail Delivery
Square D Company	990	Manufacturing
Link-Belt Construction Equip.	950	Manufacturing
Wal-Mart	869	Retail
IBM Global Services	800	Sales/Services
Ashland, Inc.	750	Energy
Raytheon Systems Co.	900	Manufacturing
Clark Material Handling Co.	450	Manufacturing
Galls', Inc.	450	Manufacturing
Lexington Herald-Leader	450	Newspaper
Valvoline Co.	450	Headquarters, Manufacturing
General Electric Co.	400	Manufacturing
Source: Data from the Greater Lexington Chamber of Commerce, combined with data from the <i>2000 Kentucky Directory of Manufacturers</i> (published by Harris Info. Source in cooperation with Kentucky Cabinet for Economic Development and Kentucky Chamber of Commerce)		

Exhibit 3-15 also lists major employers in the Fayette County Metropolitan Statistical Area (MSA) that are included on the list of the top 200 Manufacturing Establishments in the *2000 Kentucky Directory of Manufacturers* as well as Eastern Kentucky University. The Fayette County

Metropolitan Statistical Area (MSA) consists of Scott, Bourbon, Clark, Madison, Jessamine, and Woodford Counties. While manufacturing represents only approximately 12 percent of Fayette County's workers, significant manufacturing jobs exist in the MSA area.

EXHIBIT 3-15
MAJOR EMPLOYERS IN FAYETTE COUNTY MSA COUNTIES
FEBRUARY 2000

Employer	County	Number of Employees	Industry
Toyota Motor Manufacturing	Scott	7,900	Manufacturing
Eastern Kentucky University	Madison	1,750	Education
Johnson Controls	Scott	1,500	Manufacturing
Osram Sylvania, Inc.	Clark/Woodford	1,355	Manufacturing
World Color Book Services (Quebecor World)	Woodford	800	Maps
Tokico (USA), Inc.	Madison	700	Manufacturing
Yuasa, Inc.	Madison	600	Manufacturing
NACCO Materials Handling Group	Madison	590	Manufacturing
Leggett & Platt, Inc.	Clark	500	Manufacturing
Dresser Industries	Madison	400	Manufacturing
Quality Manufacturing	Clark	400	Manufacturing
Donald Co., Inc.	Jessamine	350	Manufacturing

Source: Data from the Greater Lexington Chamber of Commerce combined with data from the 2000 Kentucky Directory of Manufacturers (published by Harris Info Source in cooperation with Kentucky Cabinet for Economic Development and Kentucky Chamber of Commerce)

3.3.6 Agriculture

The United States Census of Agriculture is taken every five years on years ending in 2 and 7 (since 1978). The census defines the term “farm” (since 1974) as “any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year”. Data in Exhibit 3-16 has been taken from the Census as it relates to changes in the number, area, and average size of farms for Fayette County between 1978 and 1997. While agriculture continues to be an important land use for Fayette County and to the County’s economy, the total

number of farms in the County has declined steadily over the last 20 years. On the other hand, the average size of farms has steadily increased from 163 acres in 1978 to 182 acres in 1997, and the value of land and buildings has increased by 76 percent over this time period. The total number of acres in farms in Fayette County has fluctuated over the 20-year period depicted in this Exhibit, but has generally stayed over 80 percent of the county’s total acreage until 1997 when it dropped to 74.6 percent. Changes in local land use policies strive to continue to retain the significant rural lands of Fayette County as active agricultural operations.

EXHIBIT 3-16
FARMS AND LAND IN FARMS
FAYETTE COUNTY

	1978	1982	1987	1992	1997	% Change 1978 - 1997
Number of Farms	962	976	912	836	745	-22.6
Number of Acres in Farms	157,092	150,479	155,594	147,154	135,923	-13.5
Average Size of Farm	163		171	176	182	11.7
Acres in Croplands	108,933		99,479	93,187	90,866	-16.6
Acres in Harvested Croplands	35,122	32,639	29,511	30,047	31,209	-11.1
Market Value of land and buildings (dollars, avg. per farm)	382,329		563,491	567,674	674,160	76.3
County Land Area	86.3 %	82.6 %	85.4 %	80.8 %	74.6 %	-13.6

Source: US Bureau of Census, Census of Agriculture, 1978 - 1997

3.3.7 Tourism

Exhibit 3-17 depicts travel expenditure and employment in Fayette County from 1982 to 1996. Tourism continues to grow and to be a significant part of Fayette County's economy. The County's status as the "horse capital of the world" has brought national and international recognition to the central Bluegrass region, which has helped boost the tourism and hospitality industry.

EXHIBIT 3-17 TRAVEL EXPENDITURES FAYETTE COUNTY		
	Expenditures	Full-Time Employment
1999	\$603,010,533	15,327
1996	\$603,010,533	15,327
1990	\$476,930,236	13,688
1985	\$240,506,510	10,861
1982	\$186,201,636	10,058
Source: <u>Economic Impact of Kentucky's Tourism and Travel Industry</u> , Kentucky Department of Travel Development, Division of Marketing and Advertising, Tourism Research Series.		

3.3.8 Retail and Wholesale Trade

Data trends regarding the number of establishments, number of employees, and total sales for retail and wholesale trade for Fayette County are depicted in Exhibits 3-18 and 3-19. While the volume of both retail and wholesale sales has steadily increased, the number of retail establishments and retail employees has shown an overall decrease between 1982 and 1997. The largest number of retail establishments was reported in 1982 with a decline to 1987, a slight increase in 1992, and another decline in 1997. The number of employees peaked in 1987 and has continued to decline since then. The number of wholesale establishments and employees, on the other hand, grew steadily between 1982 and 1992 and has declined somewhat between 1992 and 1997 for an overall increase in both categories.

EXHIBIT 3-18 RETAIL TRADE TRENDS FAYETTE COUNTY					
	1982	1987	1992	1997	% Change 1982-97
Establishments	1,871	1,656	1,672	1,251	-33.1%
Employees	22,091	27,198	26,654	20,363	-7.8%
Total Sales (in \$000's)	1,331,034	1,902,811	2,457,373	3,133,071	+135.4%
Source: US Census Bureau, <u>Census of Retail Trade</u> , 1982, 1987, 1992, 1997.					

EXHIBIT 3-19 WHOLESALE TRADE TRENDS FAYETTE COUNTY					
	1982	1987	1992	1997	% Change 1982-97
Establishments	490	520	570	492	+0.4%
Employees	6,321	7,257	7,268	6,529	+3.3%
Total Sales (in \$000's)	2,546,028	3,083,367	3,190,967	4,181,465	+64.2%
Source: US Census Bureau, <u>Census of Wholesale Trade</u> , 1982, 1987, 1992, 1997.					

The decline in the number of retail establishments may reflect the decline of the small “mom and pop” type retail establishment and the influx of the large chain groceries and discount department stores. This trend would be anticipated to continue, as a number of “big box” type retail establishments have been constructed since the 1997 Census of Retail Trade has been completed. These include the Wal-

Mart and Lowe’s on Nicholasville Road; Lowe’s on Richmond Road; Wal-Mart on New Circle Road in northern Lexington, Meijer and other retail at Hamburg Place; Home Depot on Richmond Road; and Kroger at Beaumont. When new retail census data is collected and released in 2002, the Commission will be better able to track changes and the impact of big boxes since 1997.

3.3.9 Service Industry

Data trends regarding the number of establishments, number of employees, and total sales for the service industry for Fayette County between 1982 and 1992 are depicted in Exhibit 3-20. Data for 1997 is not readily available in this format and may be researched in more detail. Data in Exhibit 3-20 reflects Fayette County’s increasing role as a service provider. The total number of establishments, total number of employees, and total sales for service industries has increased steadily for Fayette County between 1982 and 1992. According to the Chamber of Commerce, nearly one-third of the area’s businesses are in the service industry. Health care services contribute significantly to the services economy, with four of the top ten largest employers being health care related. Because of Lexington’s central location within the state, the area has become a natural hub for health care for Central and Eastern Kentucky.

EXHIBIT 3-20 SERVICE INDUSTRY TRENDS FAYETTE COUNTY				
	1982	1987	1992	% Change 1982-92
Establishments	1,503	1,968	2,294	+52.6
Employees	14,697	22,760	26,389	+79.6
Total Sales (in \$000's)	521,037	885,254	1,427,666	+174.0
Source: US Census Bureau, <i>Census of Service Industry</i> , 1982, 1987, 1992.				

3.3.10 Income

Exhibits 3-21 and 3-22 depict total personal and per capita and median household income for Fayette County over time. The median income data also provides a comparison with the national and state data and shows that Fayette County’s median income is higher than the national median.

EXHIBIT 3-21 TOTAL PERSONAL AND PER CAPITA INCOME FAYETTE COUNTY			
	Total Personal Income (000)	Per Capita Income Current Dollars	Per Capita Income in 1980 Dollars
1995	\$4,806,594	\$25,042	\$13,540
1990	\$4,380,700	\$19,361	\$12,206
1985	\$3,014,507	\$14,214	\$10,885
1980	\$2,039,389	\$9,977	\$9,977
1976	\$1,226,188	\$6,219	\$9,066
Source: Cabinet for Economic Development <i>Kentucky Deskbook of Economic Statistics</i> .			

EXHIBIT 3-22 MEDIAN HOUSEHOLD INCOME FAYETTE COUNTY						
	Median Household Income			Percent of National Median		
	1989	1993	1995	1989	1993	1995
Fayette Co.	\$28,056	\$32,228	\$35,887	93.3 %	103.2 %	105.3 %
Kentucky	\$22,534	\$25,222	\$28,929	75.0 %		
United States	\$30,056	\$31,241	\$34,076			
Source: University of Louisville's State Data Center, Kentucky Population Research, 3/99.						

3.4 EXISTING URBAN SERVICE AREA LAND USE ANALYSIS

3.4.1 Introduction

The following information summarizes the Lexington-Fayette Urban County Government (LFUCG) Urban Service Area past and present land use data. The existing land use data used in this *Plan Update* is dated January 30, 2000 and provides a “snapshot in time” of urban land use within the Lexington-Fayette County’s Urban Service Area planning sectors and planning areas. Existing land use maps, data tables and charts were developed for existing 1995 and existing 2000 land use, absorption rates and land use comparisons among major land use categories (a complete land use data analysis is available from the Division of Planning). Additional tables and maps related to future land use and proposed use of vacant and horse farm land are found in and discussed in Section 6.3 of this *Plan Update*. The data review and analyses compared present data, 1996 *Comprehensive Plan* data and past comprehensive planning documents to assess land use and development trends.

Land use information is included as part of the Comprehensive Plan so that public and private interests are informed about land use and development trends in the Urban Service Area. In addition, this information gives planners, Planning Commission members, Council members, LFUCG Divisions, and other governmental agencies valuable information for planning and guiding Lexington’s future growth and infrastructure needs. With the advent of more accurate and improved geographical information systems (GIS), both private and government agencies should be better able to forecast when and where opportunities and infrastructure problems may occur. This data becomes increasingly important as full development occurs in the Urban Service Area.

The Urban Service Area is divided into four planning areas and twelve planning sectors for land use mapping and analysis purposes. The planning sectors have been utilized for many years and are depicted on Map 3.3. “Planning areas” is a newer concept and relates to the four parts of Lexington and four map panels produced for this *Plan Update*, discussed in more detail in Section 6.3. The planning area “North of New Circle” includes planning sectors 6 and 7, and subarea 8A. The “East of New Circle” planning area includes subareas 8B, 9A and 12, including a majority of the Expansion Area. The “South of New Circle” planning area includes planning sectors 10 and 11 (including 11D), plus subarea 9B. The fourth area is “Inside New Circle Road,” Sectors 1 through 5. These planning areas are also superimposed on the sectors on Map 3.3. These areas and sectors closely correlate to census tracts, traffic analysis zones (TAZs) and/or distinctive physical boundaries. The planning area and sector boundaries enable an evaluation of land use distribution throughout the Urban Service Area (see Map 3.3).

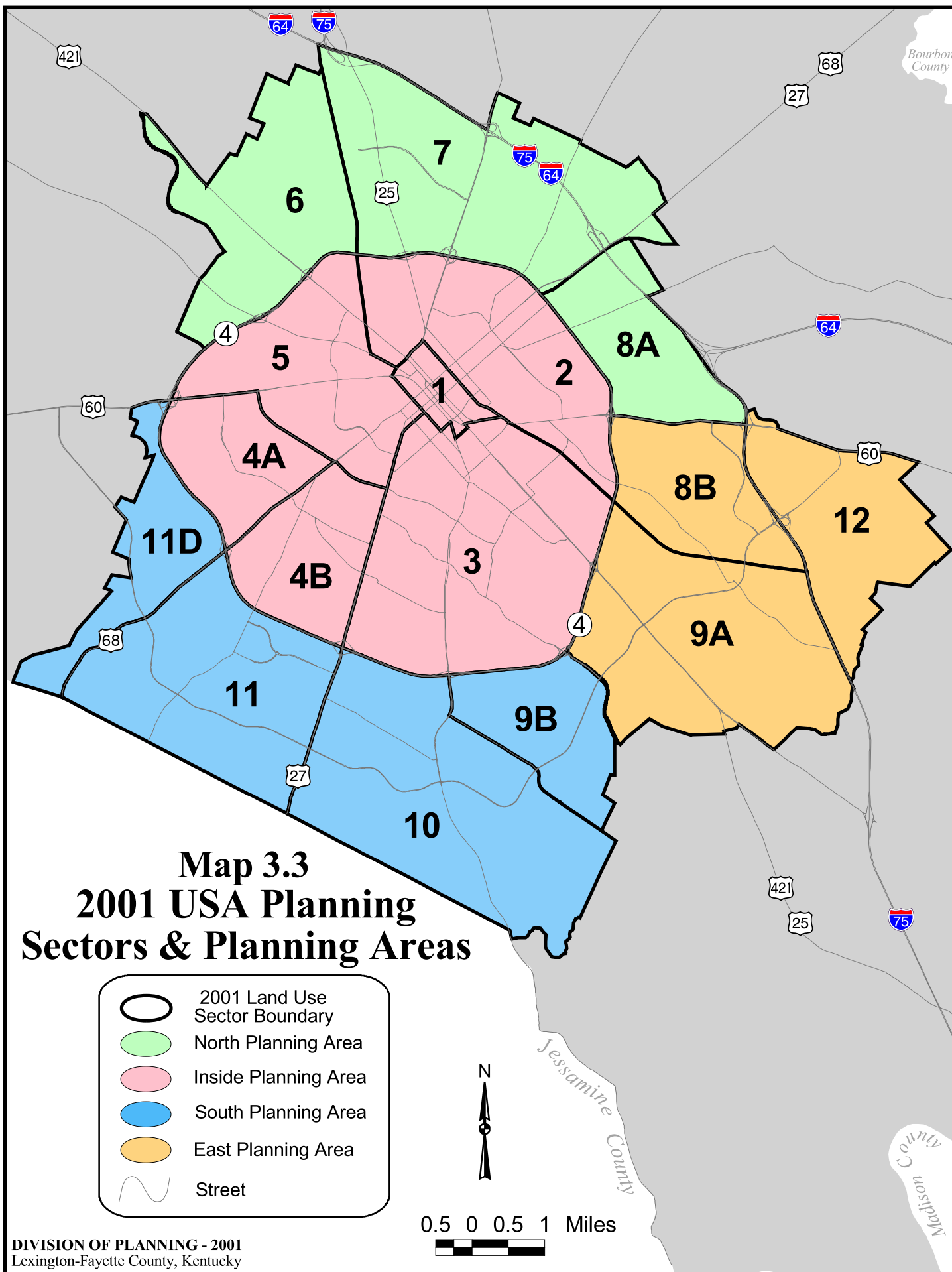
There are four major land use groupings utilized for summarizing urban land use statistics: Residential, Commercial, Employment, and Public/Semi-Public. Specific land use categories are defined in Section 6.1 of this *Plan Update*. The following information discusses the land use changes that have occurred within the Urban Service Area between 1963 and 2000.

3.4.2 Historic Land Use Trends: 1963 – 2000

Historic trends in Urban Service Area land use reflect Lexington’s growth as a regional economic center and transportation hub. The Urban County continues to attract people from surrounding counties, counties outside the metropolitan area, and people from other states seeking better opportunities and the unique “quality of life” that exists in the Bluegrass Region. US Census figures report that from 1960 to 2000, Lexington’s

population grew from 131,906 persons in 1960 to 260,512 persons in 2000. This represents an increase of 97 percent, or 128,606 persons.

This rate of growth has resulted in once vacant or agricultural land being developed as housing, shopping, employment, and the accompanying public/semi-public land uses to accommodate the community’s growth. Population shifts within the Urban Service Area during this time period have placed increased demands on public services and infrastructure in suburban locations. In 1996, 5,400



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acres were added to the Urban Service Area to provide land for new residential, commercial, employment and public/semi-public land. The existing land use and average annual absorption rate

tables detail total land use in acres from one time period to another, as well as the rate that land was absorbed from 1963 to 2000 (see Exhibits 3-23 and 3-24).

EXHIBIT 3-23 SUMMARY OF TOTAL EXISTING LAND USE (IN ACRES) 1963-2000 URBAN SERVICE AREA							
	Residential	Commercial	Employment	Public & Semi-Public	CIR/U	Total (1)	Total (2)
Oct-63	10,500	1,200	1,300	4,100	800	13,000	17,900
Oct-72	13,500	2,000	2,000	4,700	900	17,500	23,100
Jan-78	15,553	2,300	2,300	5,200	1,000	20,153	26,353
Jul-86	18,706	2,741	2,788	6,009	1,161	24,235	31,405
May-89	19,747	3,018	2,924	6,176	1,120	25,689	32,985
Aug-95	22,217	3,187	2,942	7,450	1,375	28,346	37,171
Jan-00	23,765	3,470	3,153	8,920	1,282	30,388	40,590
1) Total (1) is the summation of Residential, Commercial and Employment land use categories.							
2) Total (2) is the summation of all existing land use categories, taken from source data.							
3) CIR/U includes circulation, parking and utilities (see Section 6.1 for further details)							
4) Many more detailed notes were printed with this previously released table and are available at the Division of Planning							
Source: Lexington Fayette Urban County Government, Division of Planning; Long Range Planning Section.							

EXHIBIT 3-24 APPROXIMATE ANNUAL ABSORPTION RATES (IN ACRES) 1963-2000 URBAN SERVICE AREA							
Years	Residential	Commercial	Employment	Public and Semi-Public	CIR/U	Total (1)	Total (2)
63-72	333	89	78	67	11	500	578
72-78	391	57	57		19	505	620
78-86	371	52	57	95	19	480	594
86-89	368	98	48	59	(14)	514	558
89-95	344	37	3	124	47	383	555
95-00	415	84	51	155		550	711
1) Total (1) is the summation of Residential, Commercial, and Employment land use categories.							
2) Total (2) is the summation of all existing land use categories, taken from source data.							
Source: Lexington Fayette Urban County Government, Division of Planning; Long Range Planning Section.							

Over the 37-year period (1963 – 2000), the percentage of total urban land devoted to each of the four major land use groupings has remained relatively proportional, with little fluctuation over time. Growth in the commercial and employment land use groupings between 1963 and 1972, however, resulted in slight increases in these percentages, which have generally continued to the year 2000. Total acres of urban residential, approximately 58 percent of the developed land within the Urban Service Area (USA), increased by 13,265 acres between 1963 and 2000, a 126

percent increase. Commercial land uses increased approximately 2,270 total acres (189 percent) over the 37-year period, increasing from 6.7 percent of the total urban land to 8.5 percent. Annual absorption rates for Commercial land use during the late 1980s reflect the strong economy. Land classified as Employment increased by approximately 1,853 acres (143 percent) since 1963. In the 1980s, the percent of land in this category fluctuated between 7.3 percent and a high of 8.9 percent of the total urban land use. The public/semi-public land use grouping, approximately 22 percent of the total

urban land, increased 4,820 acres (117 percent) between 1963 and 2000, providing past and present citizens with essential and many desirable public and community services.

Employment land uses and Commercial land uses provide many jobs for residents and contribute to the tax base of the Urban County. Land development

from 1963 to 2000 in Fayette County has provided housing opportunities, new jobs, higher quality schools, spacious parks, and other community facilities that enhance the “quality of life” for citizens. These amenities contribute to attracting more people into Fayette County and the region.

3.4.3 1995 – 2000 Comparison/Analysis

The following information discusses the land changes that have occurred within the Urban Service Area between 1995 and 2000. The Urban Service Area consisted of approximately 54,454 acres (approximately 85 square miles) of land in 2000 (see Exhibit 3-25). This total includes the 210 acres added to the USA in 1998 due to the addition of the Bracktown area into Sector 6, North Area.

During the *1996 Comprehensive Plan* process, the Urban Service Area was increased by approximately 5,400 acres. Other land use changes are attributed to new development, infill and redevelopment, and the rezoning of land parcels to different land uses. Urban Service Area land use changes from 1995 to 2000 occurred at different rates and various locations throughout the Urban Service Area (see Exhibit 3-26). The data tables and existing land use chart summarize the existing land uses and changes that have occurred within the Urban Service Area between 1995 and 2000.

Residential

The urban Residential major land use grouping increased from 22,217 acres in 1995 to 23,765 acres in January 2000, an increase of approximately 1,548 acres (seven percent). Over this time period, Low Density Residential (LD) land use increased 653 acres, from 16,655 acres to 17,308 acres (or 4% of the total Residential acres). Medium Density Residential (MD) land use increased 517 acres, from 3,238 to 3,755 acres (16% of the total Residential acres); and High and Very High Density Residential (HD and VHD) increased by 378 acres (16% of total Residential acres) (see Exhibits 3-25 and 3-26).

The USA “South of New Circle Road” planning area experienced the majority of the total Residential land use change from 1995 to 2000 with a 785-acre increase in Residential land use (51 percent of the total increase in urban residential land). Thirty-

five percent of total new residential growth was located in the “East of New Circle Road” planning area, and 18 percent was located in the “North of New Circle Road” planning area. The Residential land use category for the planning area inside New Circle Road decreased by 55 acres between 1995 and 2000. Of the Residential growth in this period, the South planning area had the greatest acreage increase for the Low Density Residential and High and Very High Density Residential land use categories, while the East planning area had the greatest acreage increase for the Medium Density Residential land use category (See Exhibits 3-25 and 3-26).

Commercial

The urban Commercial major land use grouping utilized in Exhibits 3-23, 3-24, and 3-25 includes Professional Service/Office (PS); Retail, Trade and Personal Services (RT); and Highway Commercial (HC) land use categories. Commercial land use was approximately 8.5 percent of the total developed urban land (six percent of the total USA) in 1995 and in 2000. Between 1995 and 2000, Commercial land use increased from 3,187 acres to 3,470 acres, an increase of approximately 283 acres (9 percent). Of the total 283-acre increase, Professional Service land use (PS) increased by 36 acres (13% of change in Commercial acres), Retail Trade and Personal Services category increased by 279 acres (98% of change in Commercial acres), and Highway Commercial (HC) land use decreased by 31 acres

EXHIBIT 3-25 EXISTING 2000 LAND USE BY AREA AND SECTOR																		
URBAN SERVICE AREA SECTOR REGIONS																		
URBAN SERVICE AREA TOTAL ACRES	Inside New Circle Road					North of New Circle Road					South of New Circle Road					East of New Circle Road		TOTAL
	17,750					11,430					14,695					10,579		
Land Use Categories	1	2	3	4A	4B	5	6	7	8A	9B	10	11	11D	8B	9A	12	Totals	
Low Density Residential - LD	18	349	2,970	1,107	1,385	818	185	1,075	1,127	1,122	2,346	2,273	785	274	1,175	299	17,308	
Medium Density Residential - MD	73	859	659	83	40	171	61	115	109	310	514	157	96	165	341	0	3,755	
High & Very High Density Residential - HD & VHD	86	340	526	96	24	321	0	79	55	120	582	28	30	23	391	0	2,702	
Professional Services - PS, PS/CIR, PS/HD	63	49	136	90	108	97	5	77	17	21	26	46	20	11	180	0	945	
Retail, Trade and Personal Services - RT, RT/HD, RT/PS	39	251	177	110	145	182	0	45	61	28	120	282	64	178	278	0	1,960	
Highway Commercial - HC	5	86	36	0	16	27	2	165	90	0	0	15	6	66	50	0	565	
Employment - ORP, WW, LI, HI	15	823	68	0	84	630	707	432	13	0	0	61	0	105	216	0	3,153	
Semi-Public - SP	45	357	296	56	82	209	145	321	40	30	118	136	82	43	264	184	2,408	
Other Public Uses - OPU	16	98	534	1	2	246	275	298	1	2	21	157	11	0	16	0	1,677	
Greenspace/Open Space & Water - GS, W	6	51	315	49	48	86	54	249	100	57	210	123	91	62	366	95	1,962	
Public Education - PE	2	31	93	40	67	15	39	49	101	72	41	31	63	47	0	0	691	
Circulation/Parking & Utilities- CIR, U	124	131	173	30	67	124	49	131	56	21	84	93	38	34	80	47	1,282	
Public Recreation - PR	14	110	224	42	22	203	12	318	43	162	298	162	208	0	365	0	2184	
Horse Farms - HF	0	0	0	0	0	0	212	425	0	0	918	0	0	0	0	932	2,488	
Vacant - VAC	16	225	48	120	22	150	1,787	1,901	401	74	899	992	449	1,332	1,479	1,479	11,376	
Totals	521	3,760	6,254	1,823	2,113	3,279	3,534	5,680	2,216	2,020	6,176	4,556	1,943	2,341	5,201	3,036	54,454	

EXHIBIT 3-26
CHANGE IN LAND USE BY AREA AND SECTOR BETWEEN 1995 AND 2000

URBAN SERVICE AREA SECTOR REGIONS																	
Land Use Categories*	Inside				North of				South of				East of				TOTALS
	New Circle Road				New Circle Road				New Circle Road				New Circle Road				
	1	2	3	4A	4B	5	6	7	8A	9B	10	11	11D	8B	9A	12	
Low Density Residential - LD	1	-5	-95	34	-45	-20	165	-22	15	29	219	46	189	77	85	-20	653
	-18	-6	36	6	23	-31	61	1	48	-35	114	25	31	165	97	0	517
Medium Density Residential-MD																	
High & Very High Density Residential - HD & VHD	19	-16	5	-1	1	57	0	10	-2	0	145	8	14	16	122	0	378
Professional Services - PS, PS/CIR, PS/HD	-19	8	-5	-4	-3	13	3	-6	3	1	2	1	5	8	28	0	36
Retail, Trade and Personal Services - RT, RT/HD, RT/PS	12	6	-11	-5	-12	-10	0	23	8	-1	3	69	30	153	13	0	279
Highway Commercial - HC	4	-54	1	-1	10	4	2	-20	-14	0	0	-1	2	8	28	0	-31
Employment - ORP, WW, LI, HI	-1	-16	-3	0	-24	3	89	93	1	0	0	14	0	38	18	0	211
Semi-Public - SP	-2	27	-6	7	11	-130	4	24	3	-2	-35	64	22	-7	19	34	32
Other Public Uses - OPU	-41	2	13	0	0	5	72	10	0	-1	19	-50	11	0	11	0	52
Greenspace/Open Space & Water-GS, W	6	45	68	45	30	65	52	242	70	29	103	108	67	61	93	24	1,110
Public Education - PE	0	-1	0	-1	0	0	0	-1	0	2	0	0	15	0	0	0	13
Public Recreation - PR	-4	-4	6	0	0	100	12	-2	0	-2	-11	20	140	0	7	0	263
Circulation/Parking & Utilities - CIR, U	50	35	2	-10	31	2	-33	-142	-44	-9	41	24	-17	-29	12	-5	-94
Horse Farms - HF	0	0	0	0	0	-42	-252	-101	-1	-54	-308	0	0	-1,153	0	-62	-1,973
Vacant - VAC	-8	-23	-10	-71	-21	-16	33	-108	-85	40	-291	-328	-514	664	-533	31	-1,240

(11% of change in Commercial acres). Some of these acreage changes reflect changes in land use definitions or efforts to more accurately categorize existing uses.

The East planning area experienced the greatest acreage change in Commercial land use from 1995 to 2000 with a 238-acre increase, 84 percent of the total change in Commercial acres. The South planning area included 39 percent of the change in Commercial acreage (111 acres), while the North planning area declined by one acre, and the Inside New Circle Road planning area declined by 66 acres in the same time period.

Employment

The Employment major land use grouping includes the following land use categories: Office, Industry, Research Park (ORP), Warehouse/Wholesale (WW), Light Industrial (LI), and Heavy Industrial (HI). Employment land use changed from 2,942 acres in 1995 to 3,153 acres in 2000, an increase of approximately 211 total acres (seven percent). The greatest increase in the Employment land use grouping occurred in the North planning area, with 183 new acres. The change in the North planning area represents 87 percent of the total Employment land change in the Urban Service Area from 1995 to 2000. This change is primarily attributable to the increase in Light Industrial (LI) and Warehouse/Wholesale (WW) designated land uses in Sectors 6 and 7.

An additional 70 acres of existing Employment land use was designated in the East and the South planning areas, combined, in the 2000 existing land use survey. "Inside New Circle Road" decreased by 41 acres of Employment land use, due primarily to the reallocation of Warehouse/Wholesale (WW) and Light Industrial (LI) land use to other land uses.

Public And Semi-Public

The Public/Semi-Public major land use grouping includes land use categories: Semi-Public (SP), Other Public Uses (OPU), Greenspace/Open Space (GS), Water (W), Public Education (PE) and Public Recreation (PR). The Public/Semi-Public land use grouping increased from 7,450 acres in 1995 to 8,920 acres in 2000, an increase of

approximately 1,470 acres (20 percent). The majority of the land use changes in the Public/Semi-Public grouping between 1995 and 2000 were from changes in land use methodology. Efforts were made to more accurately portray property boundaries, street centerlines, circulation coverages, and identify right-of-way and greenspace in a more accurate and consistent manner.

From 1995 to 2000, the changes in Public/Semi-Public land use totals were as follows:

- Greenspace/Open Space and Water (GS and W) categories combined increased by 1,110 acres (75% of total change in Public and Semi-Public acres);
- Public Recreation (PR) increased by 263 acres (18% of total change in Public and Semi-Public acres);
- Other Public Uses (OPU) increased by 52 acres (4% of total change in Public and Semi-Public acres);
- Semi-Public (SP) category increased by 32 acres (2% of total change in Public and Semi-Public acres); and
- Public Education (PE) increased by 13 acres (1% of total change in Public and Semi-Public acres).

The change in existing land use methodology related to this grouping includes approximately 200 acres of previously designated Vacant land use being redesignated as Greenspace; and 475 acres of Water (W) land use, previously categorized as Vacant and Other land use, included in the Greenspace/Open Space and Water land use calculation. These methodological changes modified the Greenspace figures and created the Greenspace and Water (GS and W) land use categories. These changes created a large increase in the total Greenspace acreage: approximately 124 acres of new Greenspace land was added between 1995 and 2000.

The South planning area experienced the greatest change in Public/Semi-Public land use between 1995 and 2000 with a 499-acre increase (34% of total change)(see Exhibits 3-25 and 3-26). The

North planning area included 486 acres (33%) of the total change in Public/Semi-Public land; while the Inside and East planning areas each had approximately 16 percent of the increase in this land use grouping.

Vacant and Other

The Vacant and Other major land use grouping is used in the discussion of existing land use only. It includes the following land use categories: Vacant (VAC) land, Horse Farms (HF), and Circulation/Parking and Utilities (CIR and U). Between 1995 and 2000, the Vacant and Other land use grouping decreased 3,307 total acres. The overall decrease in this grouping is attributable to new land development, land absorption of existing parcels and land use methodology changes. As previously mentioned, methodology changes include refining the classification of land in the Circulation and Greenspace/Open Space categories and how water is designated. The new definitions for these categories are provided in more detail in Section 6.1.

From 1995 to the year 2000, all Urban Service Area planning areas experienced land development and resultant decreases in Vacant and Other land use total acreage. In the South planning area, 1,416 fewer acres were included in this grouping, comprising 43% of the total acres of change in the Vacant and Other land use grouping. In the South planning area, Sector 10 decreased by 558 acres; Sub-sector 11D decreased by 531 acres; Sector 11 decreased by 304 acres; and Sub-sector 9B decreased by 23 acres. The East planning area was second in the amount of Vacant and Other land use change, with a decrease of 1,075 acres, or 33% of total acres changed. In the East planning area, Sector 8B decreased by 518 acres; 9A decreased by 521 acres; and Sector 12 decreased by 36 acres. The North planning area was third in the amount of Vacant and Other land use change, with a decrease of 733 acres, or 22% of total acres changed in the Urban Service Area. In the North planning area, Sector 6 decreased by 252 acres; Sector 7 decreased by 351 acres; and Sector 8A decreased by 130 acres in the Vacant and Other land use grouping.

The Inside New Circle Road planning area, being mostly developed, decreased by 81 acres in the Vacant and Other land use grouping, comprising just over 2% of the total acreage change in this grouping. Inside New Circle Road planning sectors experienced vacant land change as follows: a 42-acre increase in Vacant and Other land in Sector 1, and a 10-acre increase in Sector 4B, both primarily related to clarification of circulation and parking categories. Planning sectors inside New Circle experiencing a decrease in the Vacant and Other land grouping were the following: Sector 2 by 12 acres; 4A by 81 acres; Sector 5 by 56 acres; and Sector 3 by 8 acres. The recently adopted *Residential Infill and Redevelopment Policies* addresses critical land use, as well as infill and redevelopment issues for this area (see Section 5.4). The study assessed zoning, infill and redevelopment options and growth management alternatives. This study, in conjunction with continuous land use data collection, inventory, and analysis, will provide additional data in the future to assist planners and decision makers in guiding and directing future growth inside New Circle Road and within the Urban Service Area. The following sections summarize land use changes by the four larger planning areas, with some discussion by planning sector, as per the Urban Service Area 2000 Land Use Data on file with the LFUCG Division of Planning.

3.4.4 Land Use by Geographic Planning Area

This section discusses existing land use changes between 1995 and 2000 by the four geographic planning areas discussed in Section 3.4.1.

Inside New Circle Road

In 2000, the Inside New Circle Road planning area consists of 17,750 acres (27.7 square miles) of urban land. The Inside New Circle Road planning area is made up of Planning Sectors 1, 2, 3, 4A, 4B and 5. Between 1995 and 2000, approximately 750 acres of land inside New Circle Road changed land use designation. The major land use groupings primarily showed a decrease in acreage between 1995 and 2000 for this planning area: Residential decreased by 55 acres; Commercial decreased by 66 acres; Employment decreased by 41 acres and Vacant and Other decreased by 81 acres. Only the

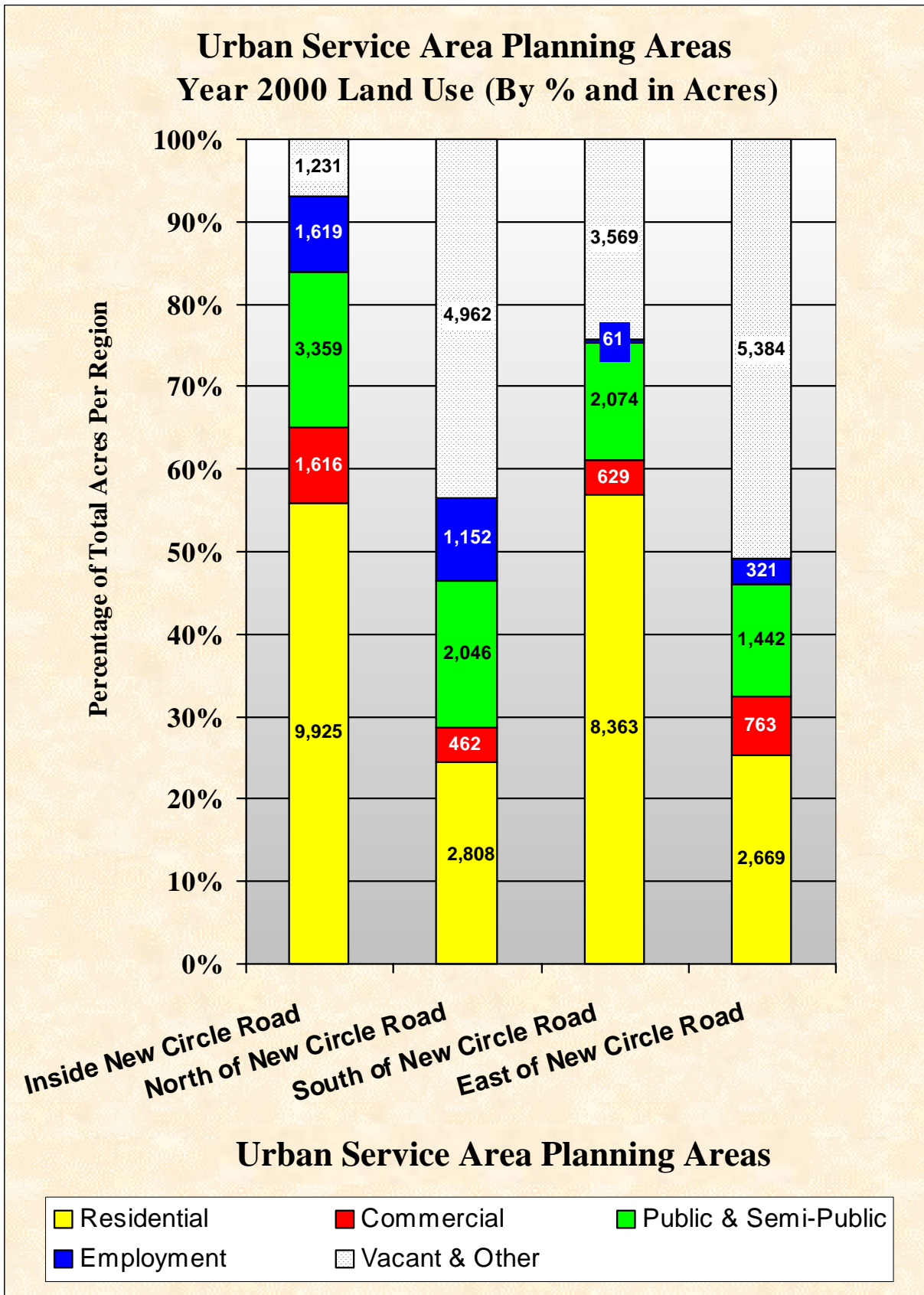


EXHIBIT 3-27 Year 2000 Existing Land Use

land use grouping of Public/Semi-Public increased (509 acres), primarily due to changes in methodology.

The Greenspace/Open Space and Water land use categories increased 259 acres, due to the improved GIS methods and methodological changes that more accurately delineate the land use categories. The other land use categories that increased in acreage inside New Circle Road were the following: Circulation and Utilities (110 acres) and Public Recreation (98 acres). Additionally, in spite of an overall decrease in residential acreage, High Density and Very High Density increased by 65 acres, and Medium Density increased 10 acres.

North of New Circle Road

The North of New Circle Road urban planning area consists of 11,430 acres (17.9 square miles) of urban land north of New Circle Road and Winchester Road. The North planning area consists of Planning Sectors 6, 7, and 8A and represents 21 percent of the total 54,454 acres of Urban Service Area land. When analyzing land use by planning area as a percent of the total 2000 Urban Service Area (USA) existing land use, the North planning area has a large amount of land use classified as Highway Commercial (46% of the USA total), Employment (37% of the USA total) and Vacant land (36% of the USA total). Between 1995 and 2000, the North planning area experienced an increase of 212 acres, due to the addition of the Bracktown area to Sector 6.

Between 1995 and 2000, existing land use acreage in the North planning area increased most significantly in the following categories: Greenspace/Water (229 acres); Employment (182 acres); Low Density Residential (158 acres); and Medium Density Residential (110 acres). Land use categories decreasing in acres from 1995 to 2000 were Horse Farms (354 acres) and Vacant Land (160 acres). Less significant decreases were Circulation and Utilities (82 acres), Highway Commercial (32 acres) and Public Education (2 acres).

South of New Circle Road

The South of New Circle Road urban planning area consists of 14,695 acres (23 square miles) of urban land. The South planning area is the area outside

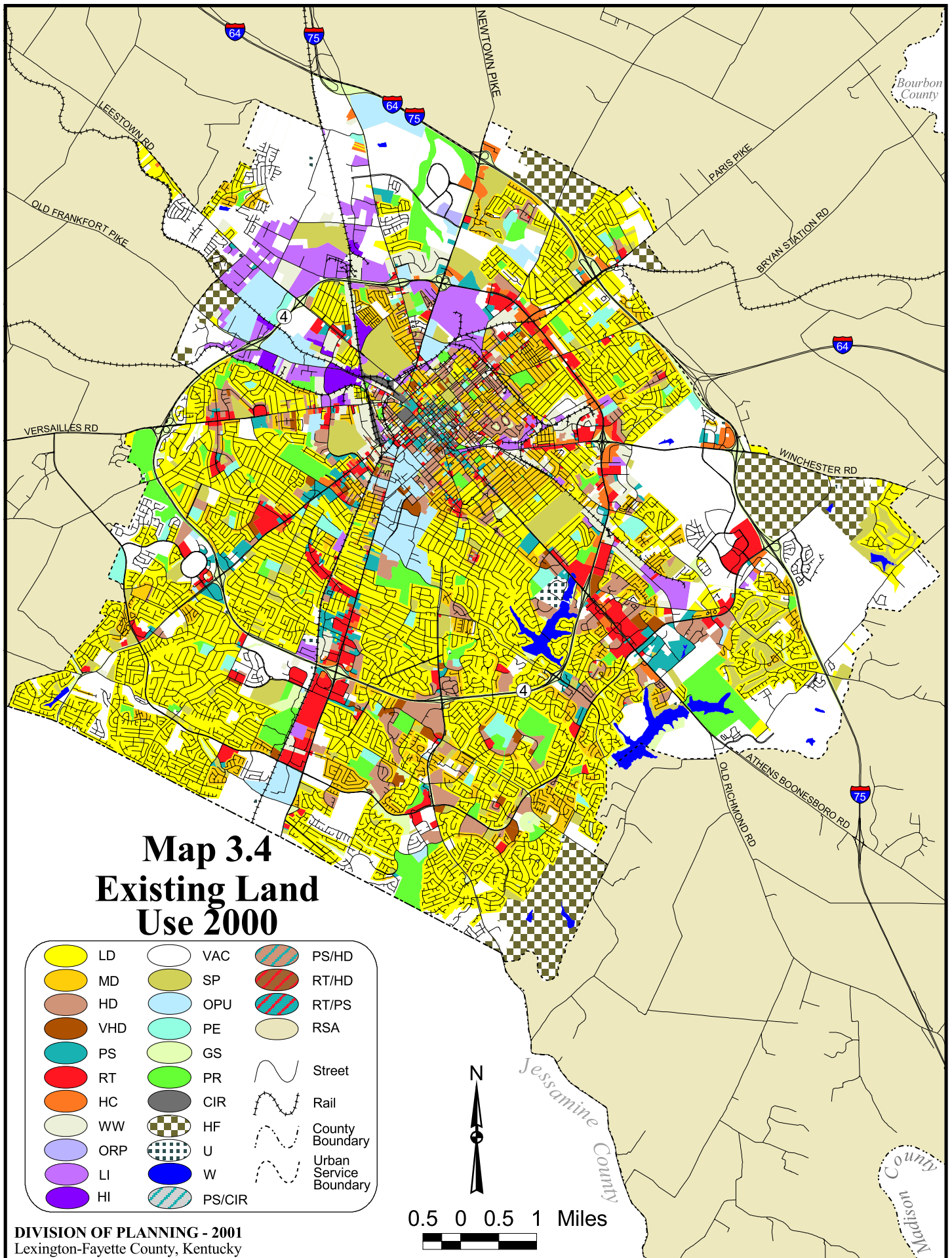
New Circle Road running south to the Jessamine County line. It is bounded to the west by the USA southwestern boundary and to the northeast by Alumni Drive. This planning area consists of Planning Sectors 9B, 10, 11, and 11D.

From 1995 to 2000, the South planning area experienced a total of approximately 1,416 acres of land use changes (see Exhibits 3-25, 3-26, and 3-27). The most significant land use change between 1995 and 2000 in the South planning area related to Residential land uses, which accounted for approximately 55% of the total land use change. One hundred sixty (160) acres were added to Public Recreation, and a large increase in Greenspace/Open Space and Water was attributable to land use methodological changes previously discussed.

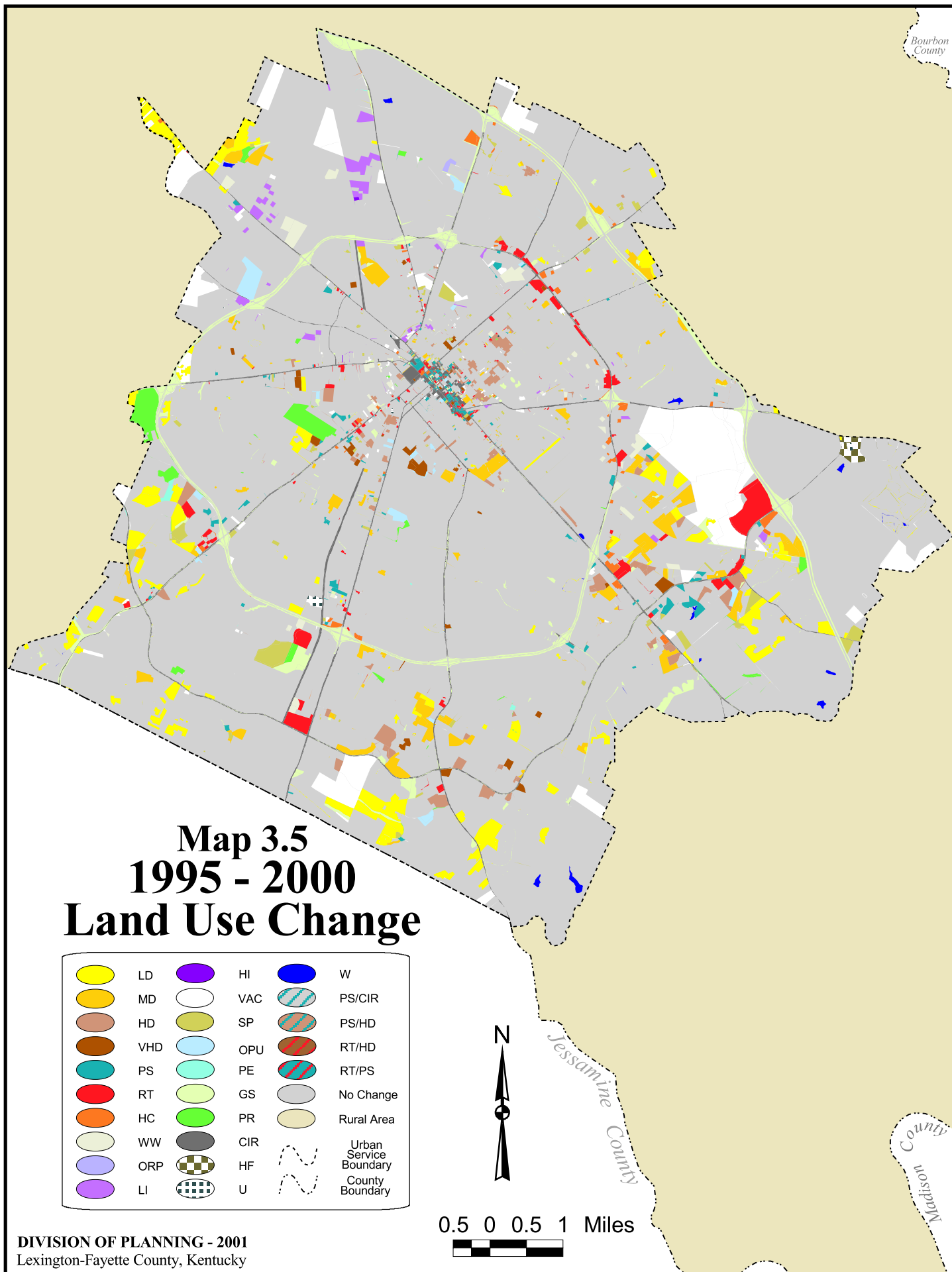
East of New Circle Road

The East of New Circle Road urban planning area contains 10,578 acres (16.5 square miles) of urban land. This planning area consists of Planning Sectors 8B, 9A, and 12. The East planning area is an area east of New Circle Road, south of Winchester Road and north of Alumni Drive, extending eastward to the Urban Service Area boundary.

From 1995 to 2000, the East planning area experienced a total of approximately 1,075 acres of land use change (see Exhibits 3-25, 3-26, and 3-27). Compared to the other planning areas, the East planning area experienced the greatest land use change (in total acres) in the following categories: Medium Density (262 acres), Professional Services (36 acres), Retail (166 acres), Highway Commercial (35 acres) and new Vacant designated land use (162 acres). One important observation concerning total land use change between 1995 and 2000 in the East planning area sectors was a decrease of 1,153 acres of Horse Farm in Sector 8B. Sector 8B Residential land use increased 258 acres, with Low Density accounting for 64 percent, Medium Density accounting for 30 percent, and High Density/Very High Density accounting for six percent of the total Residential land use change. Other notable land use changes in Sector 8B were 153 acres of additional Retail Trade and an eight-acre increase in both Professional Service/Office and Highway Commercial land uses.



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DIVISION OF PLANNING - 2001
Lexington-Fayette County, Kentucky

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In Sector 9A, 60 percent of the total acreage change from 1995 to 2000 was attributed to Residential land uses. Residential land use increased by 304 total acres, with 40 percent (122 acres) being High Density/Very High Density, followed by 97 acres (32%) of Medium Density and 85 acres (28%) of Low Density. Commercial land use increased by 69 acres during this period, with Professional Service/Office and Highway Commercial increasing 28 acres each and 13 acres of increase in Retail Trade. Sector 9B Residential land use decreased by six acres. There was a 29-acre increase in Low Density and a 35-acre decrease in Medium Density.

Sector 12's largest change in land use between 1995 and 2000 was 58 acres of Public/Semi-Public land use: Semi-Public increased 34 total acres and Greenspace/Open Space and Water increased 24 acres. Sector 12 Residential land use data, as of January 30, 2000, did not reflect the residential units that were built in the Gleneagles Development later that year.

With population increasing in the urban county and in the Metropolitan Statistical Area (MSA), future use of land and the carrying capacity of existing land will have to be closely monitored and studied to maximize use of space and to integrate different types of land uses. The *Residential Infill and Redevelopment Policies*, *Rural Service Area Land Management Plan*, Purchase of Development Rights program, land use compatibility study, and other planning concepts are currently looking at various ways to provide the best use of Urban County land. The *2001 Comprehensive Plan Update* Goals and Objectives and the future of land development in the community will depend on public and private entities working closely with neighborhoods and the larger community to find a balance that considers all interests.

3.5 ENVIRONMENTAL CONDITIONS ANALYSIS/ASSESSMENT

An awareness and knowledge of the existing environmental conditions of a community is an important component of local land use planning. A general attitude of respect for the land is essential to

the long-range planning decision making process, as well as the development process. Existing topographic and surface drainage characteristics, landscape features, historic features and even subsurface conditions must be considered in developing future land use decisions and in preparing and reviewing proposed development plans. Landscape features are addressed in more detail in the Land Capability Analysis, the *Greenspace Plan*, and the *Rural Service Area Land Management Plan*; while historic features are discussed in Section 5.3 of this *Plan Update*. Other physical features are addressed in this Section of this *Plan Update*.

Proposed developments should be sensitive and responsive to the existing environment in terms of proposed land use, location and layout of the planned buildings and other design issues. This Section of the Data Inventory and Analysis provides an overview of these existing environmental conditions throughout the Urban County for consideration in planning and decision making processes. This data should be used in conjunction with policies and plans discussed in Chapter 4, "Environmental Framework." Chapter 4 is a new chapter, addressing a wide variety of environmentally related issues, including the development and application of the Land Capability Analysis, the Greenspace and Greenway Plans and a new section entitled Environmental Quality Management (Section 4.4). Section 4.4 discusses local policy and process related to environmental issues, including conservation planning and environmentally smart growth. It includes recommended best management practices and summarizes a number of adopted or pending local environmentally related plans.

The most recent existing land use survey was completed in January 2000. At that time, approximately 14,000 acres, or 25% of the land, in the Urban Service Area were undeveloped. About 10% of this, or 1,400 acres, is environmentally sensitive with floodplains, areas of steep slopes, or sinkholes. About eight acres of the developed urban lands are classified as geologic hazard areas. In the vacant and agricultural lands to be developed (including current expansion areas and land bypassed by development due to specific problems) some

340 acres, or 2% of the land, are identified as geologic hazard areas. They will either require extensive geotechnical analysis before development, or they will need to be left as open space.

Generalized information on environmental problems may be found in Maps 3.6 and 3.7. The stream, slope and drainage basin map (Map 3.6) shows the relationship of land with greater than 15% slope to stream patterns. Map 3.7 generally locates sinkholes, geologic hazard areas and hydrologic problem areas. For details, topographic base maps, soils reports, and related information must be consulted.

The development of prime agricultural land has become a matter of concern throughout the community. In order to better understand the types of land required for agriculture and development, an intensive inventory and location of each soil type was conducted by the USDA Natural Resources Conservation Survey (NRCS), which categorized the soils as Prime Farmland, Farmland of Secondary Importance and Other Lands. This planning inventory further divided the soil groupings into floodplain soils and soils of poor quality for both agriculture and development purposes.

Existing planning, zoning and subdivision enabling legislation authorizes a full range of measures to implement the Plan's environmental objectives, although none completely prohibits development of environmentally sensitive land. Although these lands are permanently regulated, development is permitted if it conforms to public objectives and is sensitive to the environmental hazard present. None of these regulations, except for floodplain zoning, actually takes the form of a mapped zone; rather, these regulations supplement basic underlying zoning categories without changing the permissible uses and densities otherwise allowed.

3.5.1 Topography and Soils

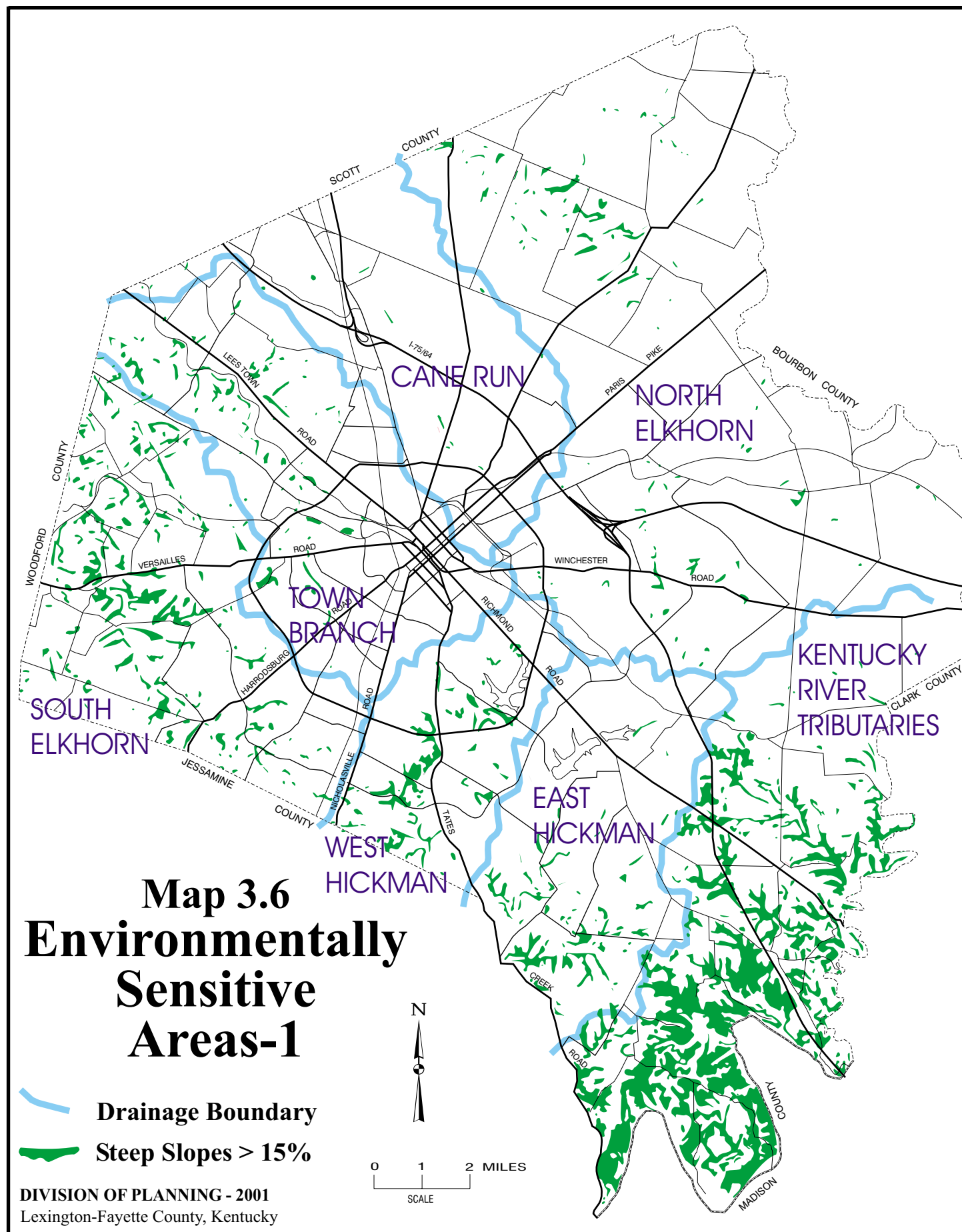
General Characteristics of the Topography

Fayette County lies in two physiographic or geologic regions. The majority of Fayette County lies within what is called the Inner Bluegrass Physiographic Region. In a general sense, the Inner Bluegrass Region may be characterized by broad undulating

upland plains giving way to wide, nearly level land along stream bottomlands. Fayette County, for the most part, is in the geographic area of the upland plains and does not have any significant streams with wide floodplains in the urban area. There is a direct relationship between the topographic influence, soil depth and stream erosion that has sculpted our landscape and the manner in which the urban area of the County has developed. The landscape has and will continue to influence urban planning and the development of our community. The Urban Service Area is located in the Inner Bluegrass physiographic area.





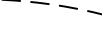
The other physiographic region, the Hills of the Bluegrass Physiographic Region (located in the Rural Service Area), covers only a small area in the southeastern part of the county, including the tributaries that are adjacent to and discharge directly into the Kentucky River. The landscape in this region is characterized by highly dissected, long and narrow ridge tops and shoulder slopes and moderately steep to very steep hillsides. The topographic change from the Kentucky River at Pool Number 9 to the top of the ridge is over 400 feet. Steep slopes are depicted on the Environmentally Sensitive Areas Map (Map 3.6). While being a beautiful vista and having unique recreation potential, access is limited and the elevation difference is extreme, creating some problems in regard to water withdrawal for our community. For the most part, the areas located in the Hills of the Bluegrass Region are not well suited for cultivation or large-scale development. These areas should be reserved for very low density development unless innovative environmental and site design elements are created and implemented.

Fayette County is dissected by nine distinct watersheds (see Map 3.6). Seven of these watersheds impact the urban area and two are completely rural. These watersheds have helped dictate where development can occur in relation to available sanitary sewer service. All development inside the Urban Service Area requires hookup to a sanitary sewer line. With two sanitary sewage treatment plants (West Hickman and Town Branch) serving the seven urban watersheds, engineering

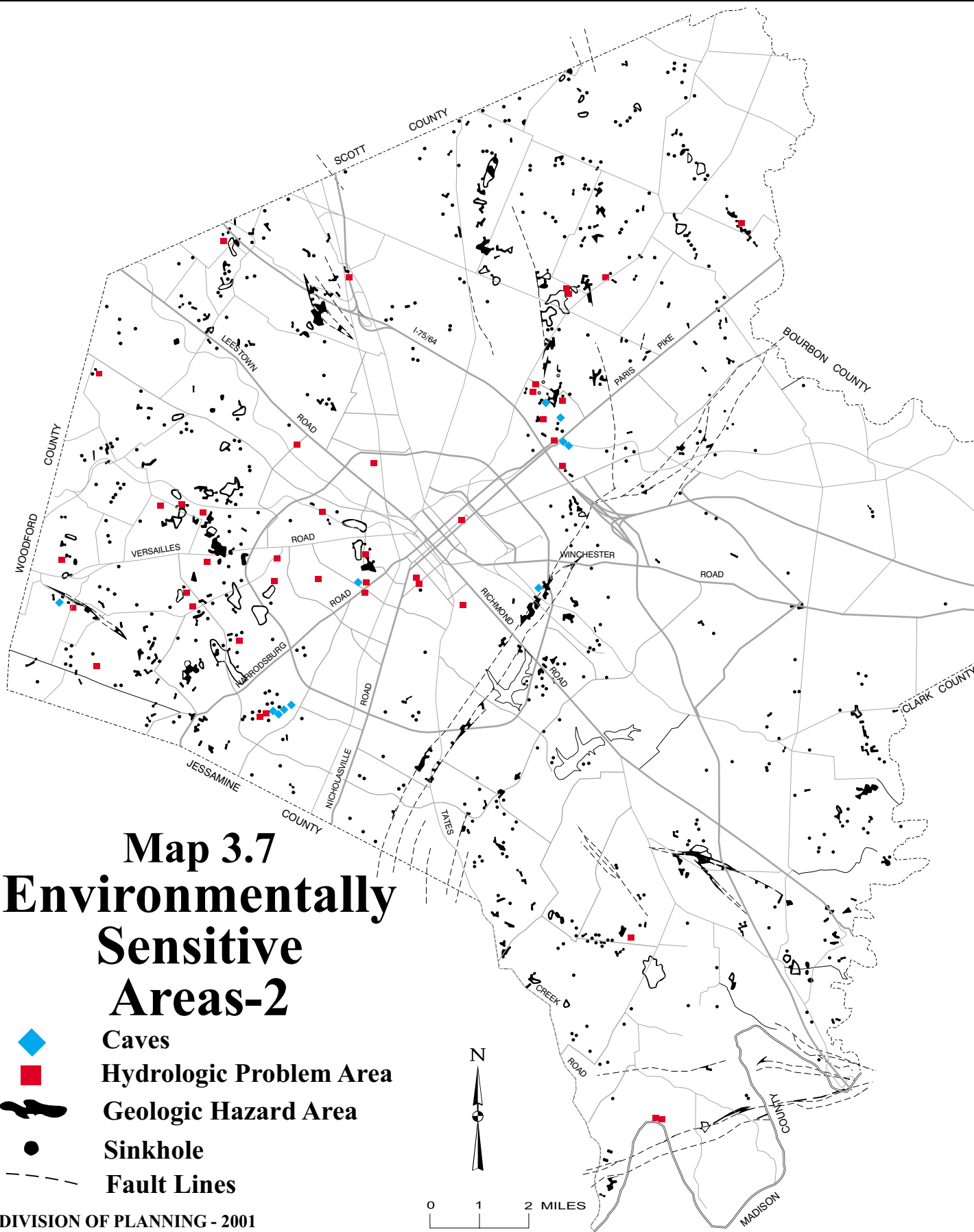
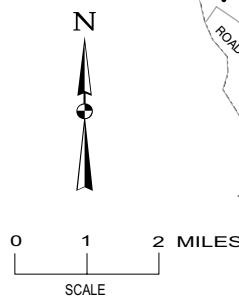


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Map 3.7 Environmentally Sensitive Areas-2

-  Caves
-  Hydrologic Problem Area
-  Geologic Hazard Area
-  Sinkhole
-  Fault Lines

DIVISION OF PLANNING - 2001
Lexington-Fayette County, Kentucky



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solutions for sewage treatment are sometimes difficult. In order to utilize only two treatment plants, booster and pump stations have to be strategically located to collect and transport the sewage to the treatment plants. From a water quality standpoint, failure and discharge from sewer overflows or pump failure can also create problems. The discharge at the two sewage treatment plants may also be problematic at times, due to the low water flow of the receiving streams relative to the sewage discharge. See Section 4.4.3 on Water Quality and Land Use Planning and Section 7.3 for more information regarding sanitary sewer service in the urban area.

The older area of Lexington developed on a generally topographically high area. All streams that originate in Fayette County drain out away from the core area. This physiographic feature originally defined the orientation of the downtown grid layout and helped shape the development of our community. Urban Lexington does not experience widespread flooding from any one stream; however, numerous stream segment flooding problems exist that are localized. A majority of the storm event flooding problems occur in the older developed areas of Lexington where storm sewer piping may experience a variety of problems that range from being non-existent, being undersized, or having collapse problems, to not being able to accommodate infill development, due to increased development and stormwater runoff. These problems are being addressed in the LFUCG *Floodplain Management Plan* (see Section 4.4.4) and the Division of Engineering Stormwater Manuals (see Section 7.4).

General Characteristics of the Soils

Soil types are derived primarily from the bedrock geology. The thickness of the residual soils is determined by the physical nature and location of the soils, given the parameters of water transport and deposition via water runoff, erosion and the prevailing slope of the land. Fayette County is predominately underlain by Lexington Limestone Formation. Karst formation, or the rapid underground movement of water through eroded bedding planes and caves, also plays an important

part in the thickness of the soil and has planning ramifications as well. Soils in the Inner Bluegrass Physiographic Region of Fayette County generally range from deep and well drained to thin soil cover. The soils are high in natural fertility, have clayey subsoil, and are formed in place from the weathered limestone lying underneath.

Fayette County has one of the highest percentages (68%) of prime farmland within the State of Kentucky. The majority of this farmland is composed of the Maury Silt Loam. The County also has two hydric soils, or wetland type soils, the Lanton silty clay loam and Melvin silt loam, and three soils with hydric inclusions (Lawrence silt loam, Loudon silt loam and Newark silt loam). These soils only make up 3.7 percent of the total County, but do require environmental planning when developed. Soil depth in any given area depends upon the geomorphic conditions of the surrounding area. The Maury Silt Loam covers approximately 41 percent of the land area in Fayette County and has an average depth of 3 to 8 feet before bedrock is encountered.

Soil information should be utilized when making long-range development decisions. It is important to note that in the newly developing areas, the geomorphic conditions are more severe in terms of soil type; soil thickness; steep slope; and floodplain problems. Areas adjacent to streams may have very little soil cover, with exposed rock outcrops. Areas of poorer soils and steeper lands will have thinner soil cover before encountering bedrock. This requires more blasting for underground utilities. Utility placement will encounter more constraints. Lot and foundation placement are also impacted and thus may incur greater costs. The design of subdivisions with smaller lots may require design modification of subdivisions during construction. In the future, land use may need to be constrained, modified or adjusted, given the soil classification and the physical limitations in a given area. Greenspace and floodplain planning will become more important in the newly developing areas as more problems are encountered.

In 1968, the Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service), in cooperation with the Kentucky

Agricultural Experiment Station, developed and published a soil survey for Fayette County. This survey is available at the Fayette County Conservation District office and in the Division of Planning. The NRCS has also been working with LFUCG to develop a Geographic Information System (GIS) database related to the soils of Fayette County. The data is in the final process of input into the government GIS system. The 63 soil types are being delineated into the system. Soils information is routinely utilized in the government planning process. In the Urban Service Area, the engineering characteristics of the soils are of importance in environmental issues. In the Rural Service Area, soils are playing a key factor in implementing the Purchase of Development Rights program and the Rural Land Management Plan.

3.5.2 Water Resources

Water Quality/Quantity

Water quality and quantity are important in the planning process because development affects both the quality of surface and groundwater, as well as the amount of water flowing into surface water sources. As noted earlier, water quantity issues are addressed in the *Floodplain Management Plan* (see Section 4.4.4) and the Division of Engineering's Stormwater Manuals (see Section 7.4). Knowledge of existing stream water quality is an important consideration when proposing to develop property. An impairment of water quality may affect the potential for the public to engage in water activities at the stream edge. Water quality may also determine the type of development or conditions for development, depending upon the geographic location of a specific property. Water quality assessment measures a stream's ability to support general aquatic life and fish that are edible and a stream's ability to be used for swimming and drinking water. Fishing and swimming are the "designated uses" by which streams are assessed. Streams are rated by comparing each stream to a control reach of a good flowing, high quality stream with abundant life. Streams are rated in three categories: Good (supporting designated uses); Fair (partial support of designated use); and Poor (not supporting designated use).

In Fayette County, a number of streams have been assessed. Map 3.8 illustrates the overall condition of our streams. Red line streams indicate poor water quality and do not support designated uses. Fair water quality streams that partially support some aquatic life are shown as yellow lines. The best rating of good water quality streams are shown as green lines, indicating full support of aquatic life and thus supporting the designated uses. Not all of Fayette County streams have been assessed. Non-assessed streams are indicated as blue line streams. As individual stream assessments occur, the data will be entered into our GIS mapping system.

Stream water quality deterioration may result from one problem or a combination of problems in any given watershed. Urban areas with a higher concentration of industrial and commercial activity tend to have higher incidents of pollution discharge at a given point. The *1998 Kentucky Report to Congress on Water Quality* found that, of the total stream miles in non-attainment, non-point source pollution affected nearly three times the miles of stream as point sources. Activities that typically produce pollutants that affect water quality in rivers and streams are listed below:

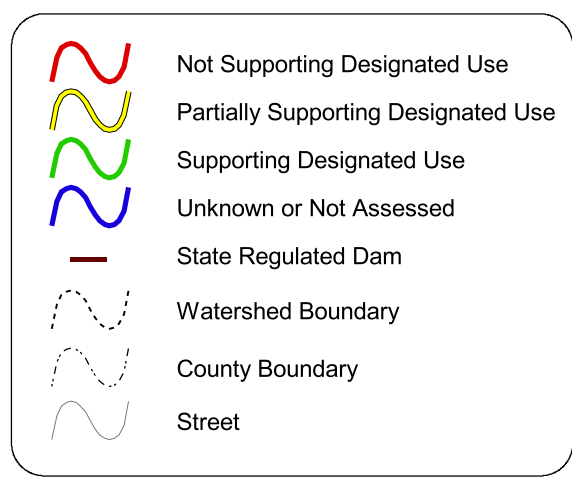
Point Sources

- Municipal Package Plants
- Industrial Discharges
- Combined Sewer Overflows

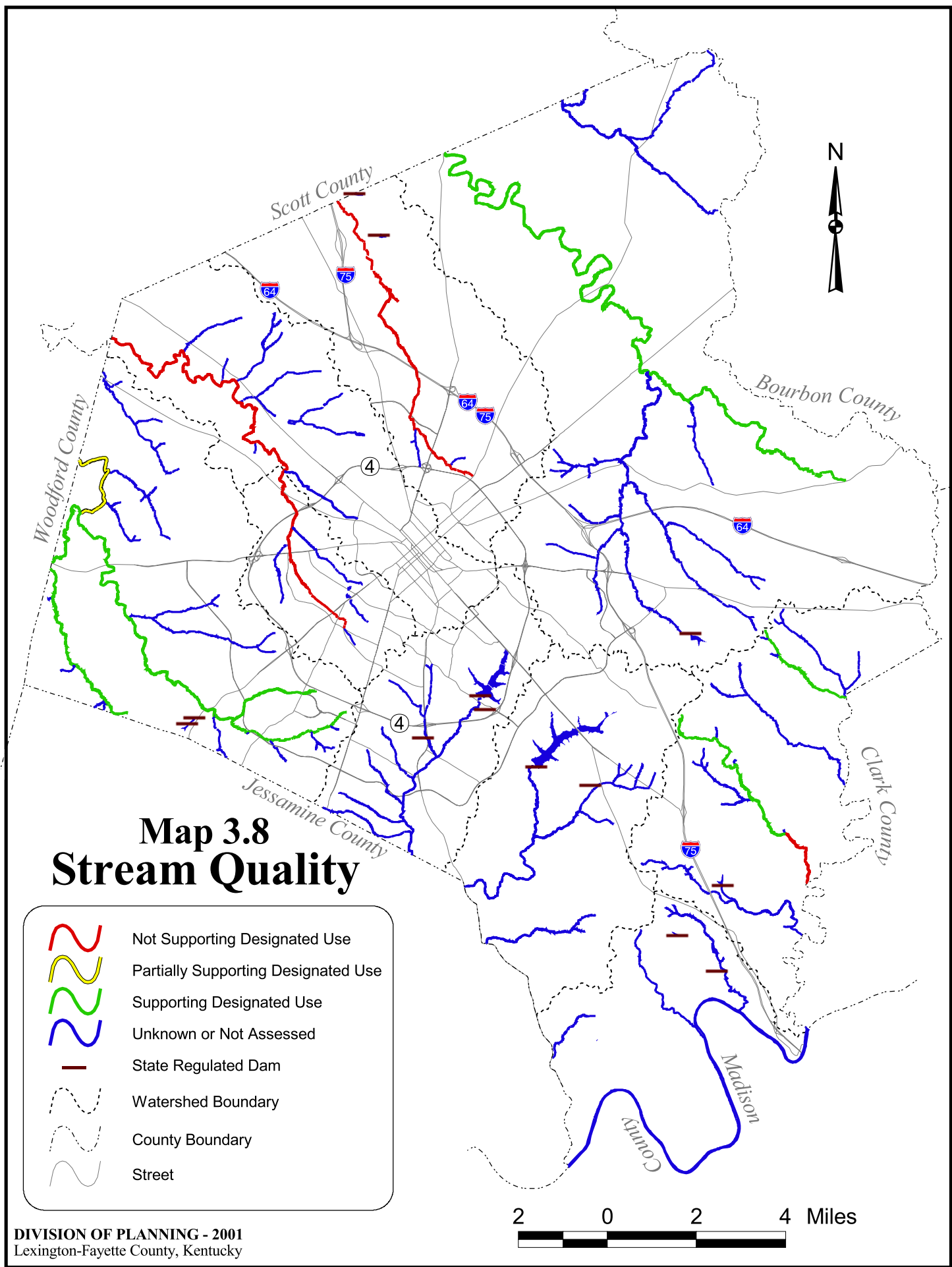
Non-point Sources

- Resource Extraction
- Agriculture
- Land Disposal/Septic Tanks
- Urban Runoff/Storm Sewers
- Hydro/Habitat Modification
- Silviculture
- Construction/Development
- Other

Map 3.8 Stream Quality



DIVISION OF PLANNING - 2001
 Lexington-Fayette County, Kentucky



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Information related to impaired Fayette County streams is available from the LFUCG Division of Planning or the Kentucky Division of Water. Information regarding possible causes and sources of impairment, as well as uses no longer supported by the streams, is also available.

Drinking Water

The Kentucky River is the primary source of drinking water for Fayette County residents and businesses. See Section 7.2 for information on water suppliers and sources for Fayette County residents. The River is also the sole source of potable water for many communities along its entire length. As the largest community relying on the River for its primary source of drinking water, Fayette County needs to take a lead in protecting the River's water quality. A reliable source of affordable water is an important community asset and impacts development patterns in urban areas. The quality of a community's raw water source can significantly impact the cost of providing that water to the customers.

Drinking water wells in Fayette County have been decreasing over the past thirty years. In Fayette County, it is estimated that potable water distribution lines do not serve approximately 2,000 people. Water well records are incomplete throughout the state. The state did not require water well records for each drilled water well until 1984. The Water Resources Institute of the University of Kentucky, in conjunction with the LFUCG, conducted a groundwater survey in 1988 of 1,700 property owners in Fayette County. This survey identified approximately 70 wells used for human consumption of water. Thirty-one of these wells were located in the Royal Spring Wellhead Protection Area (see Section 4.4.3 for information related to the *Wellhead Protection Plan*).

A number of springs exist in Fayette County, along with the recharge area for Royal Spring, which is located in Scott County. Eighty percent of the Royal Spring recharge area is in Fayette County. Royal Spring is the primary source of water for Georgetown/Scott County. There is a direct connection between surface water and groundwater in karst aquifers. Groundwater supplies and thus, water wells, are particularly vulnerable to pollution via the groundwater. Much of the surface water in

Fayette County is diverted through sinkholes, swallets, and drainage wells into the Royal Spring groundwater basin. These features are the main paths for surface water and possible contamination to enter the groundwater system. The water can rapidly enter these conduits and be discharged within hours or days to springs.

Groundwater & Aquifer Recharge Areas

The Inner Bluegrass Area within Fayette County is underlain by carbonates, siltstone, and shales of middle Ordovician age. The bedrock surface is covered by a thin residual soil, and the area has developed mature karst surface features. Groundwater basins that make up the karst aquifers in Fayette County are produced by the dissolution of carbonate rock that forms dendritic conduit systems that discharge at springs. The most important carbonate unit in the area is the Lexington Limestone, which has developed into a shallow unconfined aquifer. Two predominant karst rock units are found in the Lexington Limestone. These are the Tanglewood and Grier Members. Both of these units are relatively soluble and allow water to move through bedding planes and joints in the rock. Solution of the bedrock allows numerous conduits of varying sizes to form in the Lexington Limestone Formation. Particular attention needs to be given to environmental problems within these two rock units during the planning process.

One of the more significant geographic areas that could be impacted by groundwater pollution is the upper portion of Cane Run Tributary. This tributary drains a portion of the urbanized part of Lexington and serves as the recharge area for Royal Spring in Scott County. It is an area where the potential for groundwater pollution can have significant negative impacts on a public water supply. Overall, urbanization has the two-fold effect on water resources – that of increasing runoff and of degrading water quality. This urban area of Lexington, with its increasing impermeable areas resulting from new roofs and pavement, can create excess storm runoff into Cane Run. Some of the water in Cane Run is diverted into a series of swallets that act as recharge points for the shallow aquifer, feeding into local wells and Royal Spring, and the remainder of the water flows on the surface into Elkhorn Creek. A contaminant can rapidly be

transported with water through solution channels with limited attenuation processes other than dilution. In karst areas, little sand and gravel occurs for the filtration of water. Dilution can be increased during a storm event and can greatly reduce the concentration of the contaminant under high flow conditions.

Water quality analysis for the springs located in Fayette County is sparse. It is known, though, that the water quality of Royal Spring varies in quality with respect to quantity of flow. The capacity of Royal Spring is difficult to determine, due to lack of historical flow data and the high variability of flow. Estimated flow from the Spring ranges from 0.5 mgd during dry periods to 50 mgd during periods of precipitation. During the drought of 1988, the spring even stopped flowing for a short period of time. The quality of water is steadily declining and will continue to decline as the recharge basin for Royal Spring is developed. It may be assumed that this will be a general trend for most of the known springs in Fayette County as development occurs.

3.5.3 Environmentally Sensitive Areas

“Environmentally sensitive area” is a term that is used more frequently and commonly than when first used in the *1980 Comprehensive Plan*. All land is not created equal; and as a result, in some instances, development controls may be required to address the physical limitations of the land. Growth can improve the quality of a community by adding new services, creating economic opportunities and enhancing an area in overall design. However, growth can cause problems if it degrades the environment or produces effects that are perceived to be negative for the community. In the development and expansion of our growth area, development needs to occur that is sensitive to the environment and results in places where people want to live and work.

A major environmental factor for Lexington-Fayette County going into the 21st Century is that the land available for future development has more overall physical problems than land developed in the past quarter of a century. Smart growth suggests that problematic physical characteristics should be carefully addressed before development occurs. It

is easier to mitigate those problems before development occurs rather than after development. Controls for the development of environmentally sensitive land in Lexington-Fayette County have been in place for years and are upgraded and enhanced often. An environmentally sensitive designation applies to any area that, due to its natural or physical setting, may have environmental problems that could be compounded if developed. Floodplains, areas of slope in excess of 15%, sinkhole areas, significant tree stands, and other general environmental areas are among the concerns addressed in the *LFUCG Land Subdivision Regulations*. Additional review of the regulations related to steep slopes, fill materials and method of placement, springs, and large topographic changes resulting from development may need to occur to ensure that these issues are being adequately addressed. Land use controls related to floodplains and soil erosion control provisions are found in the *LFUCG Zoning Ordinance*.

The regulations do not say that environmentally sensitive land cannot be developed; but if it is determined that development can occur, some safeguards, such as detailed site planning with best management practices, may be necessary to overcome the physical limitations of the land. Site review may be necessary as a part of the development plan review process to more accurately assess the potential problem. Best management practices can then be developed for environmentally smart growth. Each site may have a separate problem, or a combination of problems, that have to be addressed.

3.5.4 Geologic Hazard and Other Hazardous Areas

A geologic hazard area differs from an environmentally sensitive area in that the environmental problems in these areas are so numerous that development, even with severe limitations, would pose serious health or safety problems for the immediate or surrounding areas. Geologic hazard mitigation does not relate to aesthetics, but to the health, safety and welfare of the community. Examples of these hazards are areas of excessive floodplain, areas that have potential to

collapse due to caves underneath the rock strata but close to the surface, cliff areas with excessively steep slopes, clusters of sinkholes with drainage problems, or sinkholes that have been used as disposal points for hazardous or non-hazardous waste and refuse. The term “Other Hazardous Areas” has been added to this section for the protection of the public in case an unknown pollutant or substance is discovered during the development process. For example, some areas of illegal dumping may be an unknown until development is proposed and/or underway. All geologic hazard areas are required to be identified and located on the preliminary subdivision plan. Additional development controls for geologic hazard areas are found in the *Land Subdivision Regulations*.

As a general rule, development must be planned in a manner that allows any geologic hazard area to be left in its natural state as permanent open space. In rare cases, if the developer proposes to develop within, or otherwise impact the geologic hazard area, a comprehensive environmental assessment study of the geologic hazard area, prepared by a qualified professional, is required to be filed at the time of application for plan consideration by the Commission. During the development of these areas, it is possible that new information will be obtained during the development process that may require more controls or limitations on the development. The Regulations require the Commission to refuse to fully approve a subdivision plan unless and until it is satisfied that the safeguards will be provided that ensure that future residents will experience no loss of health, safety or welfare due to development within the geologic hazard area.

Development in sinkhole areas, which has been of concern, is specifically regulated by the *Land Subdivision Regulations*. These Regulations require geotechnical analysis for development in the sinkhole areas.

3.5.5 Environmental Consequences of Development

Simply stated, development changes the landscape. It is the intensity of change in a development area that may or may not create physical environmental problems in a given area or even impact the entire

community. In almost all cases it is cheaper to prevent an environmental problem than to develop remediation measures to fix a problem once development has started or has been completed. Environmental planning is a very complex issue that needs a better community understanding. Increasingly difficult decisions have to be made that affect land use. How should land be used? What type of development should be allowed and how would this development affect the physical properties of the land? These are the issues in comprehensive environmental planning. In the environmental arena, though, what may work in one area of the community may not work well in another area. For example, approximately 900 acres of zoned industrial and wholesale/warehouse land are found in the Royal Spring Aquifer. This aquifer provides the majority of water for the city of Georgetown. At the time of zoning, the aquifer limits of Royal Spring were unknown. Wellhead protection areas were non-existent. Today federal law mandates that a wellhead protection plan be developed and adopted by the community for the Royal Spring Aquifer because it is a public water supply. Concerns today not only revolve around the economic issues of development but also have to focus on the environmental and social issues of our community. How proposed development affects the lives of the people who live in and near it is a critical question. Increasingly, the issues of water pollution, open space, wildlife habitat, and air pollution are not only important to plan for; but in some cases require mandatory planning. These issues are not easy. What one person or group of people deem as being necessary for environmental protection, another group might object to and be against. Other issues taken for granted a few years ago, such as energy consumption, air quality and community water use, now become more important in the planning process for community-wide planning.

Today’s large-scale development techniques are totally capable of changing the surface topography and the visual and cultural attributes of a given landform. Environmental issues also become more significant and difficult to address with the utilization of smaller lot sizes. In past developments, with larger

lot sizes, it was possible to redistribute areas of problems by simply moving the footprint of a house or property line. Small lot development may create problems if an environmental issue is present. Little room is left for shifting properties, houses or roads away from natural problem areas. Smaller lot sizes also make greenspace requirements in a development more important for a given quality of life.

In looking at the environmental consequences of development, it is easy to criticize but sometimes difficult to find a happy medium where all parties are satisfied. Perhaps the number one issue that affects all development, whether it is low-density residential development or industrial development, is the issue of stormwater runoff and water quality.

Stormwater runoff is determined, to a large part, by site design and impervious surface area. Past developments were concerned with the final point of discharge and the placement of detention/retention basins. The philosophy was to change the landscape and pipe it out. Today, it is important to develop site planning and design techniques for stormwater management with low impact design in the development process. In an ideal low impact design, development modification of the landscape would create an environmentally functional landscape that mimics the natural watershed hydrologic functions of discharge; frequency; volume; and, to an extent, recharge of the groundwater. Many areas of the country are investigating the use of less restrictive curb and gutter systems that have helped to create stormwater runoff problems during a storm event. One of the major problems in the Lexington area is the development practice of stripping off the surface soils and compacting the subgrade in the entire subdivision. This creates an entire subdivision that is impervious to groundwater percolation.

Other impacts that development has on the environment are discussed below under pertinent topic headings:

Non-point Source Pollution

Pollution from runoff is a problem, not only in Lexington, but nationwide. Two types of runoff pollution can occur: point source and non-point source pollution. The majority of non-point source

pollution nationwide is due to stormwater runoff from urban and agricultural activities.

Urban runoff typically includes:

- Commercial/Residential runoff, which includes heavy metals from paved areas and nutrients, pesticides and organic (yard waste) from lawn care. Major stormwater outfalls are indicated on the watershed protection maps.
- Industrial runoff, which includes suspended solids, phenols, and other process chemicals from stack emissions and outdoor storage of products.
- Construction runoff, which includes silt from erosion.

Rural agricultural runoff typically includes:

- Pesticides, nutrients from fertilizers.
- Silt from croplands and pathogens from pasturelands.

Point Source Pollution

The majority of point source pollution locally is controlled by permit by the Kentucky Division of Water. There are a number of permitted discharge facilities in Fayette County that have National Pollution Discharge Elimination System (NPDES) point source discharge permits. Numerous other facilities and construction sites have general stormwater discharge permits. These permits are on file in the Division of Environmental and Emergency Management (DEEM) of the Lexington-Fayette Urban County Government.

Solid Waste

Development and growth also produce solid waste that requires proper planning. A number of solid waste sites, including landfills, hazardous waste sites, and dumps, are located in Fayette County (see Section 7.10). There are currently two active (permitted) landfills in Fayette County. These are both operating as construction/demolition debris (C and D) landfills only. Household and business waste is trucked out of County by a private hauler. The 35-acre LFUCG C and D landfill is located on Haley Road, with the second one located at 4400 Haley

Pike. In addition to the two active landfills, there are five inactive landfills within the County. These are the Lexington City Incinerator Landfill, the Avon Lexington Signal Depot, Jacks Creek Pike Landfill, Urban County Government Construction Demolition and Debris Landfill and the City of Lexington Landfill. The Lexington City Incinerator Landfill, the City of Lexington Construction Demolition and Debris Landfill, and the City of Lexington Landfill are all located north of Old Frankfort Pike between Forbes and New Circle Roads. The Lexington Signal Depot Landfill is located at Avon, while the Jacks Creek Pike Landfill is located in the vicinity of Raven Run Nature Sanctuary. None of these sites are within the watershed protection areas.

Hazardous Waste Generators

There are approximately 522 Fayette County facilities registered with the Cabinet under the Resource Conservation and Recovery Act (RCRA) notification requirement. Approximately 299 of these facilities are not currently generating hazardous waste. Of the remaining facilities, 158 are limited quantity generators (generating less than 100 kg per month), 47 are small quantity generators (generating between 100 kg and 1,000 kg per month), and 18 are large quantity generators (generating more than 1,000 kg per month). Review of records on file with the Division of Waste Management Superfund Branch indicate that there are three active Comprehensive Emergency Response Compensation and Liability Act (CERCLA) sites in Fayette County. These include the US Federal Correctional Institute and the US Veterans Medical Center, located on Leestown Road and Cooper Drive, respectively.

Active or Inactive Underground Storage Tanks

Records on file with the Kentucky Division of Waste Underground Storage Tank (UST) Branch indicate that there are approximately 622 underground petroleum storage tanks in Fayette County registered with the Cabinet. Based on Federal EPA estimates, it is believed that 25% of the nation's UST systems have experienced some degree of petroleum release. The LFUCG Underground

Storage Tank Regulation - Petroleum Products was originally passed by Council in January 1987 and subsequently revised in July 1990. This regulation was developed to promote responsible storage of petroleum in underground storage tanks. It should be noted that this regulation was developed to address specific local concerns and was finalized prior to the promulgation of state UST regulations. The LFUCG Division of Environmental and Emergency Management (DEEM) is responsible for administering the local UST regulations. DEEM's records indicate that there are 247 active underground storage tanks sites. This differs from the number of USTs registered with the Cabinet, since DEEM registers USTs by site (one site may have multiple tanks), while the Cabinet registers each individual UST. Additional information may be obtained by contacting the DEEM office.

Underground Injection Wells

The Safe Drinking Water Act (SDWA) protects underground sources of water through the regulation of underground injection wells. The construction and use of any underground injection well requires a permit issued under the underground injection control (UIC) program, which is a federal program administered by Region IV EPA.

The Lexington-Fayette County Health Department is currently identifying Class V injection wells in Fayette County. Class V wells include the six known major storm sewer outfalls where stormwater enters sinkholes. Due to the availability of sanitary sewers within the Urban Service Area, where the majority of businesses and homes are located, it is believed that the number of UIC wells within Fayette County is limited.

Facilities that Store, Utilize or Produce Hazardous Materials

The LFUCG Hazardous Materials Ordinance became effective in December 1995. Under this ordinance, facilities that store, utilize, dispose of or otherwise manage hazardous materials are required to register with the Division of Environmental and Emergency Management. Hazardous materials are defined under this ordinance as any chemical,

biological or radiological compound; gas, oil, gasoline, lubricant or other petroleum products, substance, solution or mixture; which, because of its quality, quantity, concentration, physical or infectious characteristics, when released into the environment, may present harmful effects to human health or welfare or to the environment. To date, 831 facilities have registered with DEEM. It should be noted that the Hazardous Materials Ordinance has provisions requiring that the environment be restored once a release occurs, requiring select facilities to develop and implement a Spill Prevention and Control Plan, and establishing a local HazMat team to handle emergency response(s).

In addition to local requirements, federal regulations issued under the Emergency Planning and Community Right-to-Know Act (EPCRA) require facilities which manufacture, process, store or use hazardous chemicals to report this information to state and local officials. Data from the 1997 calendar year indicated that approximately 160 facilities within Fayette County submitted chemical inventory forms to the Local Emergency Planning Committee as required under EPCRA. Thirty-five of these facilities are presently storing extremely hazardous substances (EHS) above threshold planning quantities and therefore are required to develop detailed emergency response plans.

Agricultural Waste Lagoons

Two permitted agricultural waste lagoons are found in Fayette County. These are located at the UK Coldstream Farm, which serves over 200 head of cattle, and the Shelby-Ogdon Swine Farm operation located on Greenwich Road, which is a small operation.

Manure Piles

The development of the cattle and equine-based industry has produced a significant amount of manure, with the majority of waste products resulting from the equine industry. This is especially true during horse events, when large concentrations of animals are present in one place, such as Keeneland Race Track, Red Mile Racetrack or the Kentucky Horse Park. The muck piles can cause significant surface

and groundwater pollution through runoff from a significant horse muck pile or sheet runoff from a field. It is important to note that, in karst areas, groundwater flow differs from other geographic areas. In areas of deep sediment with abundant sand and gravel, a natural filter occurs which can filter out bacteria and other organic or inorganic properties found in the water. In a karst region such as the Bluegrass area, very little filtering occurs; and subsurface water movement can be as fast as surface water movement, given the right conditions. Our subsurface wells and springs have high concentrations of microbial pollution. In a report on Bluegrass springs and wells, Scanlon, a researcher at the University of Kentucky, found in a study of 13 springs and 45 wells, that all of the springs and over half of the wells were polluted based on total coliform, fecal coliform and streptococci bacteria test results.

In 1989, the Urban County Government decided to enact guidelines for the control of horse muck. Commercial composting of manure piles is allowed in the agricultural rural zone as a conditional use and is subject to Board of Adjustment approval. A number of conditions must be met, including a Permit by Rule or letter of intent from the Division of Waste Management of the Kentucky Natural Resources and Environmental Protection Cabinet. Horse muck cannot be placed in streams or sinkholes.

Problem Muck Areas

Livestock yards (Lisle Road and Old Forbes Road) are a problem that is not very well regulated. The manure is a high-density product, with little straw or hay, as opposed to horse muck. It is harder to deal with due to its saturation weight and high liquid content. This facility is not in a watershed protection area. The Kentucky Horse Park has accumulated a significant amount of horse muck in the operation of the park. In the development of the *Royal Spring Wellhead Protection Plan* this issue was brought up. A pilot project for windrow composting of horse muck at the Kentucky Horse Park was initiated. It now appears that the problem has re-appeared and is again becoming an issue.

Wetlands

The amount of wetland area found in Fayette County is very limited. Wetlands are formed by land that is transitional between terrestrial and aquatic systems. Generally the water table is high, at or near the surface. The karst geology of Fayette County precludes any significant areas of wetland delineation. Small isolated areas may be found adjacent to the Kentucky River and smaller streams or in small natural spring areas. The planning and development process takes into account the presence of these springs and wetland areas. The Existing Site Characteristics Form submitted with the Major Subdivision and Development Plan Application identifies the physical properties of the site, including wetlands; floodplains; ponds and springs. They are also noted on the development plan. A field investigation is required, and the limits of each are noted. In cases of significant sites, special studies may be required.

Floodplain and Riparian Areas

Flooding creates one of the most expensive loss hazards throughout the United States. Due to the nature of our stream distribution and the topography, our flood problems are highly localized and, for the

most part, respond very rapidly to a given storm event. Lexington-Fayette County has had floodplain management since 1973, when the community started participation in the National Flood Insurance Program. As part of that program, the community adopted the Floodplain Conservation and Protection Ordinance to prevent development in the floodplain. More data on this issue may be found in the *Floodplain Management Plan* (see Section 4.4.4).

Flooding issues are expensive, and management plans often change with the emergence of newer best management practices. Newly developing areas will require more floodplain management for the simple reason that more floodplain will be encountered. Going into the 21st Century, the thought philosophy has shifted to the preservation or restoration of natural areas that were once disturbed by development. In the past, the norm was to regulate the floodways by stream modification and to rework the stream channel and stream bank in order to gain more land for development. This method of development actually created more problems with regard to future maintenance and downstream flooding.